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ENVIRONMENT VIEWS

VOLUME SIX
NUMBER FOUR
JULY/AUGUST 1983

SECOND CLASS MAIL REGISTRATION NUMBER 4405

CANADIANA
JUL 25 1983

The Work and Home Environment

ISSN 0701-9637

ENVIRONMENT VIEWS

Environment Views is published bi-monthly by Alberta Environment. Each issue deals with a specific topic from various viewpoints with the aim of increasing awareness of environmental issues among Albertans. *Environment Views* is directed by an independent board with representation from environmental groups, government and industry. The views expressed by the publication are not necessarily those of Alberta Environment.

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Alberta
ENVIRONMENT

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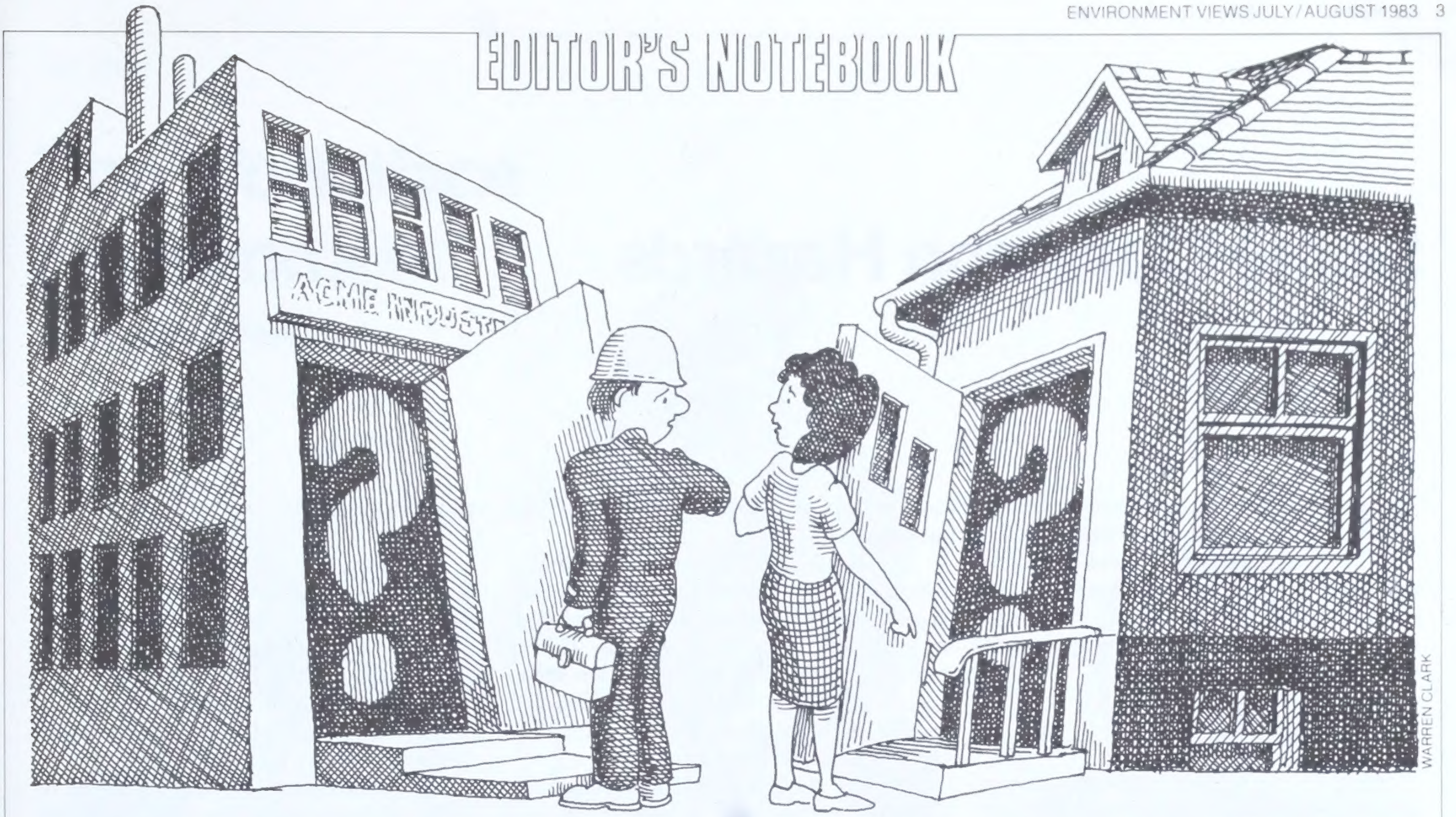
EDITOR'S NOTEBOOK



When we speak of environmental quality, what are the images which come to mind? Coastlines, perhaps, either unspoiled or oil-spattered; mountainsides pristine or scarred; and skies clear or smoggy.

These are all outdoor scenes, but the environment where most of us live and work is separated from the outdoors by insulated walls, weatherstripped doors and double-glazed windows.

In this issue of *Environment Views*, we look at workplace and home environments, largely from a health and safety viewpoint.

In looking at these two environments, varied as they are, some of the same principles apply as in other more well-recognized areas of ecology. How safe and healthy are they for their inhabitants? How can we control such factors as air quality and noise levels?

While there is general agreement that making homes, offices and factories both safe and wholesome is a worthwhile objective, there seems to be tremendous controversy about how this objective is to be met.

In setting and enforcing standards for health and safety on the job, for example, workers must be protected from hazards, while at the same time there must not be so many complex regulations that the costs of construction or production become prohibitive. In our article on regulations, we look at the question from three perspectives: that of governments, which must set standards fairly; of industry, which must maintain and pay for them; and that of the workers themselves, who must understand and carry out safeguards and who pay the cost of inadequate standards and enforcement in illnesses, accidents, or even death (story p. 23).

On the home front, the information most of us receive seems to be limited to warnings about neglected cigarettes, roller skates on the stairs or slippery bathtubs. But some of the most interesting information in this issue explodes the stereotype of hearth and home as a refuge from the rough and tumble of the outside world.

In fact, writer Ron Duffy paints a rather ominous picture of multiple hazards to both health and safety in the home sweet home. (story p. 20).

The same problems of indoor air quality plague many workplaces, even the apparently clean and safe office tower. New technology carries other dangers: many office machines create noise pollution, and video display terminals are suspected of emitting dangerous radiation. (stories p. 12 and 16).

What are the consequences of exposure to impure air and hazardous products? In most cases, we are far from knowing the answer. Although the connection between *safety* hazards and resulting accidents is usually clear, the cause-and-effect relationship between industrial and home exposure to contaminants and such illnesses as cancer or lung disease is not as clear.

Some people are highly sensitive to certain chemicals; others can withstand high levels of exposure without problems. Lifestyle is also a factor — smoking, diet or drinking habits may all play a role in the impact of workplace hazards.

In researching the articles for this issue, our writers found one refrain from industry, government and workers' organizations: in every area, more education is needed. To make intelligent decisions about protecting ourselves and others, we need good balanced information about the hazards and risks involved.

To that end, Alberta Workers' Health, Safety and Compensation maintains a library of publications and films about health and safety. This library is linked by computer to the data base of the Canadian Centre for Occupational Health and Safety in Hamilton, Ontario.

In addition to government education programs, unions are becoming increasingly involved in training and education. The Alberta Federation of Labor is adminsitering a provincial government-funded program to train instructors throughout the province to conduct on-the-job health and safety courses. The federation is now raising funds for the establishment of a workers' occupational health centre which, as well as having a clinic for the diagnosis and treatment of work-related ailments, will be a clearinghouse for research and information for workers, physicians and the community.

While *Environment Views* can not of course hope to cover the length and breadth of this massive topic, we hope to help with the education process and to stimulate thought and discussion on these complex issues.

Maryhelen Vicars, a former journalist, is the freelance editor of *Environment Views*.

Some Common Hazards

While it would be beyond the scope of this issue to detail more than a fraction of the chemical, physical and other hazards to which people may be exposed at either work or home, the following information on some common hazards may be useful.

ASBESTOS

Asbestos is the generic name for a group of hydrated mineral silicates, most of which are found in the form of fibres, known to cause cancer.

Because asbestos has been used as an insulation and grouting material for many years, there are many occupations and worksites where people may be exposed to asbestos, and programs exist, at the University of Alberta, for example, to remove or cover asbestos insulation.

Asbestos is also found in fireproof fabrics, brake and clutch linings, floor tile, spackling, patching and taping compounds and a wide range of building materials.

BENZENE

Benzene is a clear, volatile, colorless, highly flammable liquid with a characteristic odor. It has been found to cause cancer of the hematopoietic (blood-forming) system.

Benzene is found in motor fuels and widely used as a solvent for fats, inks, oils, paints, plastics, rubber and a photogravure printing. Workers exposed to benzene may include printing pressmen, petro-chemical workers, furniture finishers, welders, and gas pump attendants. Benzene is also used in arts and crafts.

DUSTS

Dusts are everywhere, formed when solid matter is broken down by natural or mechanical forces. They become a hazard when airborne and inhaled. Whether these dusts are harmful, causing lung disease, for example, depends on the properties of the particular dust, the amount inhaled, the condition of an individual's lungs, and the size of the particles. Occupational dusts will cause lung disease more rapidly in smokers than non-smokers.

Mineral dusts are formed from rocks, stones and ores and generated during thousands of different operations from mining or quarrying to roadwork or crafts such as pottery. All mineral dusts cause some irritation to the lungs; some cause serious diseases such as fibrosis (silica), chronic bronchitis, emphysema or cancer.

Organic dusts are derived from living materials and from natural products such as wood or leather. The harvesting, storage, transportation and processing of plant products (cereals, flax, cotton, timber) all generate organic dusts. Another group of organic dusts are the spores of fungi, released in the handling of hay or other crops or in cheesemaking. All organic dusts are recognized as causing lung disease, including allergic reactions, asthma or lung cancer. Certain wood dusts may cause nasal cancer.

Chemical dusts from powdered synthetics including bleaching powders, detergents, pesticides and dyes produce various kinds of lung damage, depending on the properties of the chemicals involved. Caustics cause chemical burns when inhaled in quantity and prolonged exposure to low levels may contribute to laryngitis or bronchitis. Other chemicals provoke allergic reactions. Because some chemical powders now used are relatively recent inventions, their possible cancer-causing properties are not yet known.

LEAD

Lead occurs naturally in plants and soils; man-made sources include lead smelting and refining, brass manufacture, the manufacture of batteries and lead paints, and in the combustion of lead fuels.

Young children are at risk with lead exposure, suspected to cause mental retardation. They may be exposed to lead in the form of roadside dust from lead-based gasoline combustion; from lead-based paints and, in some cases, to "take home" lead from parents working with lead on the job.

LIGHTING

Lighting requirements at home or in work situations vary with the type of work being done. Highest levels are needed for fine work; relatively low levels may be satisfactory for corridors or storage areas. As well as the amount and intensity of light, other characteristics including shadows, glare contrasts, and color need to be considered.

Poor illumination contributes to loss of seeing efficiency, headaches, eye strain, stress and poor safety conditions. Glare and shadow can contribute to fatigue and inability to concentrate. Special lighting problems may be associated with video display terminals (see story p.16).

NOISE

The impact of noise, whether intermittent loud noises or a continual background, whether pure or broad-band in tone, is a very complex one. The sense of hearing, the auditory system, is linked with a whole series of other systems in the body including balance, vision, and circulation. Therefore, in addition to the obvious effect of excessive noise — impairment and loss of hearing — other symptoms of exposure can include disturbance of psychomotor reactions, insomnia and even weakening of color vision.

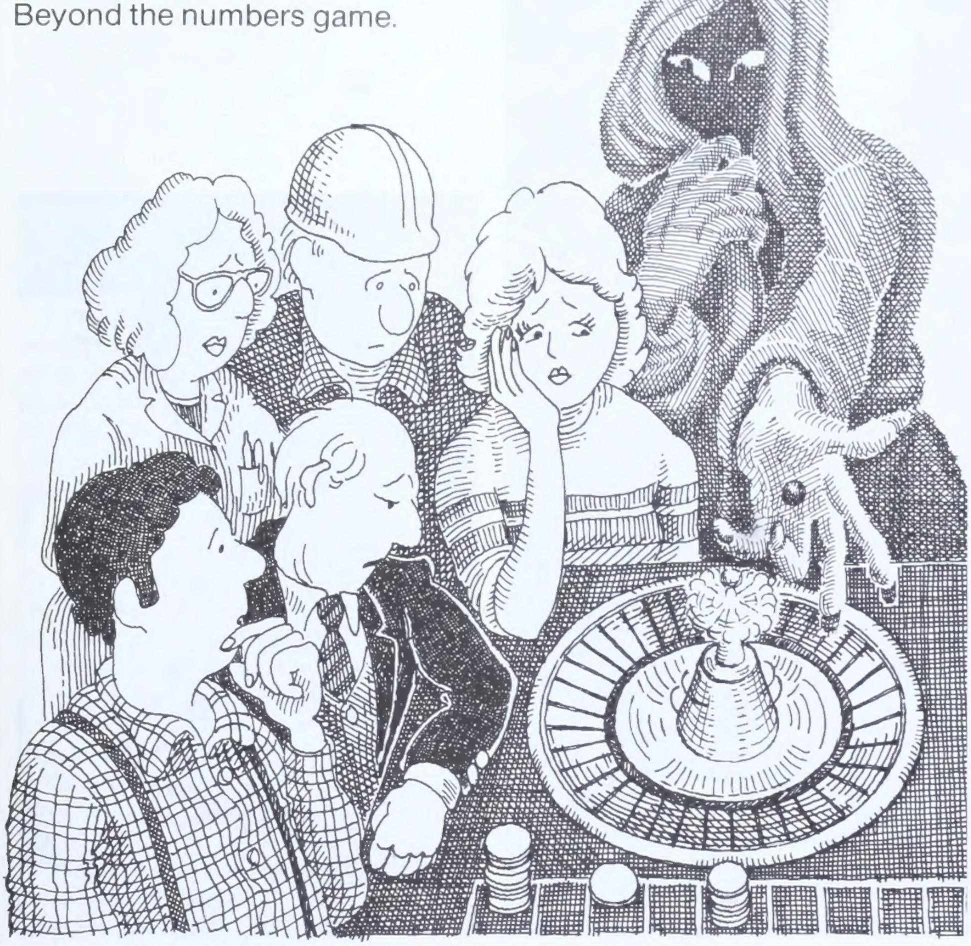
Where noise levels on the job make communications difficult, the risk of accident increases. At home, background noise can be a source of stress and sleep disturbance, although both at home and at work people are capable of adapting to noise to some extent. Work demanding a high level of skill and concentration is particularly affected by noise.

Taken from *Health Hazards of the Human Environment,* World Health Organization, Geneva, 1972; from *Occupational Lung Diseases: an Introduction,* the American Lung Association, 1979; and *Hazards in the Workplace,* a 1981 report prepared for the Alberta Foundation of Labor by Ray Sentes.

Paul Tisdall

The Workplace Environment

Beyond the numbers game.



BILL McKEOWN

Dr. Robert Orford

Dave Watt of Tofield near Edmonton died on February 19, 1983. He was 46 years old and left a wife and three daughters. From the age of 20 he had worked in the insulation business, first as an insulator and later as a supervisor. Dave Watt died from mesothelioma, a particularly virulent kind of cancer caused by the inhalation of fibres from the asbestos insulation he had worked with for most of his life.

Occupational health and safety is a minefield of explosive and complex issues. To understand it, you do need statistics. Medicine, law, politics, economics and labour relations all enter in. But behind the numbers, the specialist jargon, and the vested interests, occupational health and safety is the story of Dave Watt and others like him.

A major hurdle to be overcome for anyone trying to understand occupational health and safety is that the issue is often highly politicized. Labor squares off against management and government sides with its closest ideological ally. In fact, a government's political philosophy can color its whole approach.

An unfortunate consequence of the politicization of occupational health and safety is that it is extremely difficult to get a reliable assessment of the extent of the problem. Numbers of workplace illnesses, injuries and deaths given by the labor movement are consistently higher than those endorsed by industry, for example.

A just-completed study by the Canadian Centre for Occupational Health and Safety in Hamilton, Ontario, examined the Canadian system for collecting and reporting data on occupational health and safety. The centre is funded by the federal government and run by a tripartite board with representation from labor, management and governments. It is reputedly the best source of unbiased information in the country.

The new study has yet to be published. But, according to Dr. Ian Easson, head statistician at the centre and author of the study, the results show that available data on occupational health and safety in this country is inadequate and inaccurate. It is based largely on haphazard reporting of accepted claims for workers' compensation. But more than 20 per cent of workers are not even covered by workers' compensation. Even the data which is collected is not systematically and thoroughly analyzed and reported, Dr. Easson says.

Dr. Herbert Buchwald, Alberta's managing director of the Occupational Health and Safety Division of Workers' Health, Safety, and Compensation, disputes this. He says that in Alberta, at least, compensation data is thoroughly analyzed and distributed.

Dr. Easson thinks that the available data may provide an acceptable partial profile of workplace accidents. But it seriously underestimates illnesses because "occupational diseases that are compensated are a very small fraction of the true picture, the tip of the iceberg." Part of the problem, Dr. Eas-

ALBERTA GOVERNMENT PHOTO

In Alberta, forestry is one of the most dangerous occupations, as judged by the number of claims for compensation.

BILL McKEOWN

Dr. Rubin Feldman

son explains, is that Canadian physicians typically receive only a few hour of training in occupational health and often do not recognize occupational diseases. Dr. Easson also suggests that governments may be reluctant to collect and report data which might point to health and safety problems and create a political uproar.

Dr. Easson contrasts this with the system in Finland where more than 1,000 specially trained physicians monitor the health of workers and where a comprehensive occupational health and safety report is published annually. With this system, he says, it is possible to pinpoint problem areas and take early action. In Canada, very little of this information is available and problems can go unnoticed and unchecked.

Dr. Robert Orford, Alberta executive director of Occupational Health Services, agrees that our monitoring and data collection systems are inadequate. But while he describes the Finnish system as "fantastic", Dr. Orford contends that to try to put a similar system in place in Alberta would be "tremendously expensive and impractical". It would require an infusion of funds into occupational health and safety perhaps 15 to 20 times greater than at present. "While we're behind Finland, we're working toward improving the infrastructure of occupational health in Alberta as fast as we can."

The imperfect and scanty statistical information available indicates that there are about 2,000 compensated occupational deaths annually in Canada and well over one million compensated injuries and illnesses. In Alberta in 1981, accepted compensation claims in all categories numbered over 150,000.

A recent long-term study by Labor Canada found that fatalities per man-hour worked are highest in mining and second in forestry. So these could be described as the most dangerous industries in the country. In Alberta accepted compensation claims per man-hour worked in 1981 were highest in forestry and construction.

Comparative data published by labor movement advocates indicates that among industrialized countries Canada is a relatively unhealthy and unsafe place to work. Compared with the United States, Britain, Japan and West Germany, we ranked first in fatalities in construction and mining and second in manufacturing.

Perhaps the best way to get a feel for problems of occupational health and safety is to examine specific examples. In terms of the number of workers involved, farming accidents and workplace cancers are not necessarily the most serious occupational health hazards. In fact, only about 6.5 per cent of Alberta workers are involved in agriculture and to the end of 1979, only four workplace cancer deaths had been compensated in the entire history of Alberta. Nevertheless, these two examples do illustrate many of the problems and controversies surrounding occupational health and safety, Part of the farm safety problem is that farms are often family operations, with children handling chemicals and heavy equipment.

and therefore provide an excellent entree into the field.

AGRICULTURAL ACCIDENTS

Few agricultural workers are covered by workers' compensation, so information on accidents, diseases and deaths in farming is the least reliable of any major industry. In Alberta, for instance, only 1.5 per cent of agricultural workers are covered and the government acknowledges that its data base is inadequate.

However, a recent study sponsored by the Saskatchewan government found that farming has the third highest death rate among occupations in North America. It is widely acknowledged that farmers are often ill-informed and not careful enough about the dangers of the toxic fertilizers, herbicides and pesticides they handle. But virtually all studies concur that the single greatest cause of farm injuries and deaths is farm machinery.

ALBERTA GOVERNMENT PHOTO

Edmonton's University Hospital has a good deal of experience in dealing with these accidents. Some 13 per cent of amputees treated are farmers, a far greater proportion than any other occupation. Dr. Rubin Feldman, the hospital's Director of Physical Rehabilitation, feels that these disabling accidents have a particularly devastating impact on farmers: "Many own their own place so that they are dependent upon themselves to bring in the harvest, let's say. If they are suddenly disabled the chances of their farm surviving are low. Also many don't have workers' compensation. So it becomes a disaster for them, both in terms of ever being able to return to work and also in terms of financial compensation during the long period of rehabilitation."

An Alberta government study confirmed this situation, finding that only one out of 117 permanently disabling farm injuries was covered by workers' compensation. Similarly, only one of 106 work-related farm deaths was covered.

The Alberta farming community may be its own worst enemy in this regard. Historically, it has resisted compulsory workers' compensation and largely refused to participate in the current voluntary program. While several other provinces have made coverage for farm workers mandatory, Alberta has not.

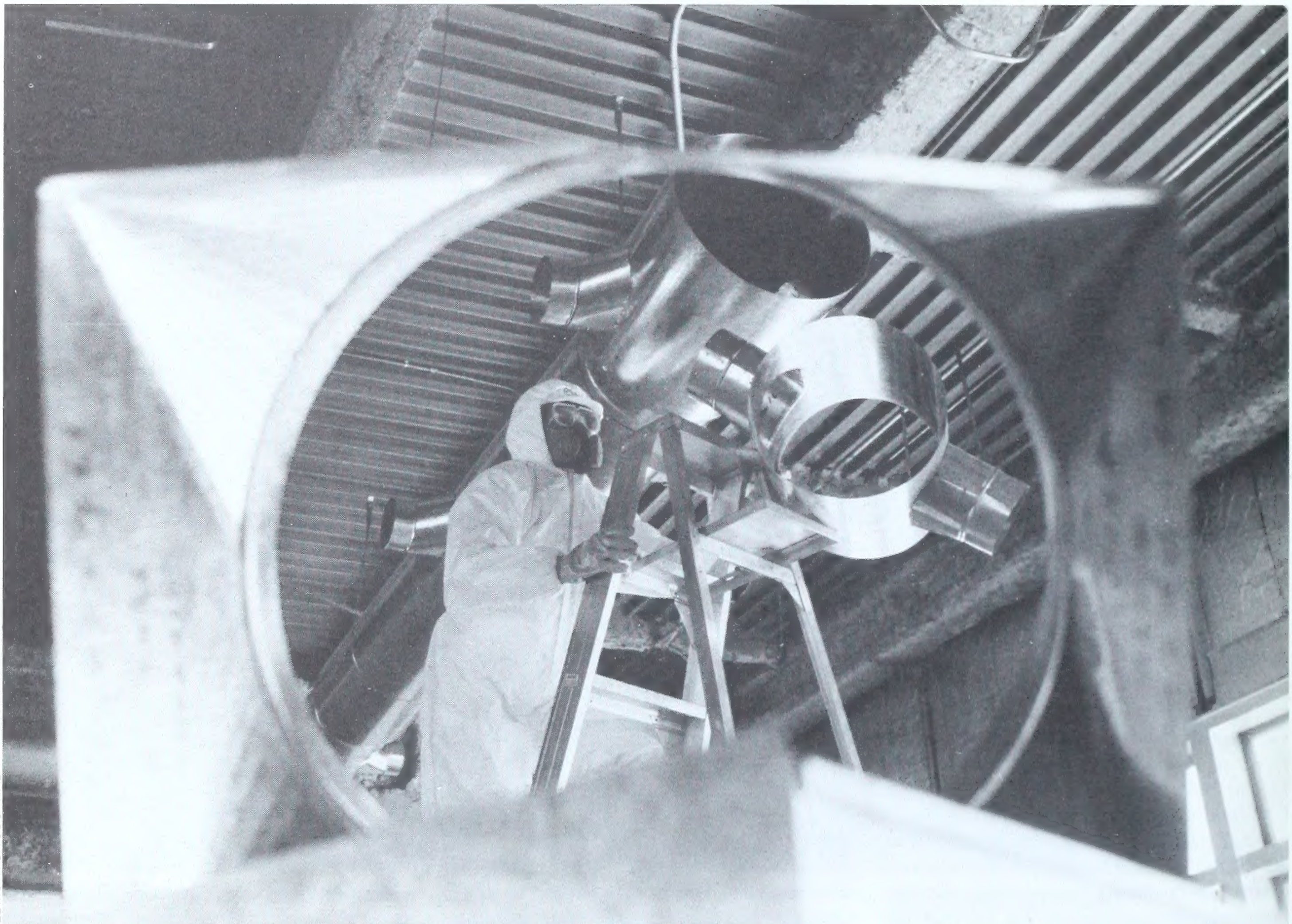
John Sanders, a professor of ergonomics or human factors engineering at the University of Toronto, has studied farm machinery accidents. Handling of farm machinery is, he says, often less than optimum. Farmers are in a hurry, ignore safety procedures and may be working with old or ill-maintained equipment. However, he believes that most farm accidents could be prevented with better equipment design. "The exhortation to be safe, to be careful, to be alert has yet to be shown to have any effect whatsoever. Machines should be designed so that the opportunity for injury is very much reduced." One major cause of farm accidents, Sanders says, is poorly designed equipment that will clog unless safety guards are removed.

Farming is not only an occupation that involves dangerous equipment but often the entire family as well. The combination can be lethal — fully 19 per cent of reported farm accidents in Alberta involve children.

Alberta Agriculture's Farm Safety Program "tries to make the farming public aware of the inherent dangers of farming," according to program manager Solomon Kyeremanteng. Working through the district home economists and district agriculturalists of the extension offices, the program offers publications, workshops and seminars in agricultural safety topics.

WORKPLACE CANCER

In recent years, the industrial use of chemicals has grown astronomically until there are now an estimated 60,000 chemicals in production with 1,000 new ones being added each year. This growth in the chemical industry has sparked increasing concerns at all levels about workplace cancer. It is feared that many of the new chemicals could be carcinogens.



Special precautions are needed in handling asbestos, identified as a cancer-causing agent.

EDMONTON JOURNAL BILL McKEOWN

Testing substances for carcinogenicity can involve both epidemiological studies on humans — studies where the cancer rates in the exposed population are compared with normal rates — and tests on lab animals. So far human epidemiological studies have clearly implicated only about 12 substances as carcinogens. Animal tests have provided conclusive evidence for the carcinogenicity of about another 200 substances.

However, only a small fraction of industrial chemicals has been exhaustively tested and there is some evidence that many more could be carcinogens. For instance, the International Agency for Research on Cancer recently evaluated 442 industrial chemicals and processes and found experimental evidence for carcinogenicity in 143 (32 per cent) of them.

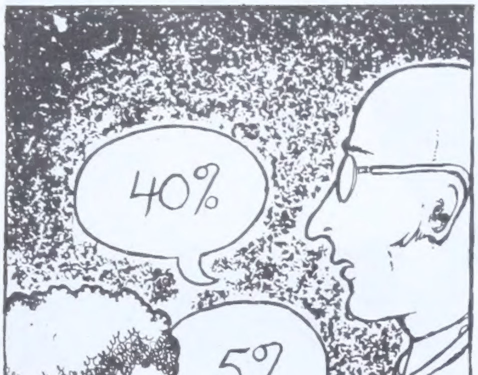
The whole field is in fact rife with controversy. There is debate about potential carcinogens, safe levels of exposure and even the value of the epidemiological and lab tests used to assess risks. At bottom, cancer causation remains an unsolved problem in biology.

Two substances which are widely accepted as carcinogens and to which some Alberta workers are exposed are asbestos and vinyl chloride. Asbestos has been used primarily as an insulating material although other materials have now largely replaced it in new construction. Asbestos causes mesothelioma. In addition, lung cancer rates as much as ten times higher than normal are being reported in asbestos insulation workers. Vinyl chloride is used in the production of polyvinyl chloride (PVC) plastics found in a wide variety of products including clothing, food wrappings and construction materials. Elevated cancer rates, particularly liver cancers, have been found in vinyl chloride workers.

However, the number of cases of cancer attributed to vinyl chloride exposure has been declining as a result of better regulations and handling practices in the industry, Dr. Buchwald says.

How big a problem is workplace cancer? If one accepts compensation statistics, not very big at all. Of the approximately 1,000 occupational deaths compensated in Canada each year, the vast majority are caused by accidents and only about 75 are due to diseases, including cancer. In fact, up until the end of 1979 only 675 cancer deaths had been compensated in the entire history of workers' compensation in Canada.

However, Dr. Easson of the Canadian Centre for Occupational Health and Safety says that these figures grossly underestimate occupational deaths due to diseases in general and to cancer in particular. Dr. Easson contends that the most widely accepted and reliable figure for the proportion of all cancers that are occupational is five per



MARTHA JONES

cent. Using this percentage, Dr. Easson calculates that of the approximately 40,000 annual cancer deaths in Canada, 2,000 are occupational — a figure double the deaths in all categories reported by workers' compensation. On these calculations, then, workplace cancer leaps from an insignificant problem to potentially the greatest occupational health threat of all.

A further implication of Dr. Easson's analysis is that very few occupational cancers are actually recognized and compensated. In fact, this is precisely the conclusion reached by Harvard law professor Paul Weiler whose report for the Ontario government on workers' compensation was released last April. Weiler praised the Ontario compensation board as the best in North America in dealing with occupational cancer. But even at that, he conservatively estimated that fewer than one in 17 work-caused cancer deaths is actually compensated. Because of this, Weiler reported, surviving dependents in Ontario are being deprived of $150 million annually.

Clearly, both Dr. Easson and Weiler's analyses rely on an occupational cancer rate far in excess of that reported to by workers' compensation authorities. In fact, results of scientific studies of the proportion of all cancers attributable to workplace carcinogens range all the way from less than one per cent to as high as 40 per cent.

Where do these percentages come from and which is the most accurate?

The figure of one per cent or less was endorsed in a 1981 study published in the Canadian Medical Association Journal and authored by a team of physicians from the Ontario Workmen's Compensation Board. The physicians compared accepted compensation claims for cancer to all cancers in Ontario. Finding that less than one per cent were compensated, they argued that this figure accurately reflects workplace cancer rates because all claims are compensated where there is reasonable medical evidence that the cancer is caused by workplace factors. They also suggested that one per cent could well be an overestimate because guidelines give the benefit of the doubt to workers.

The higher, five per cent figure is based largely on comprehensive, government-sponsored research by two British epidemiologists, Richard Doll and Richard Peto. Doll and Peto argue that smoking and dietary factors such as excess fat are the chief causes of cancer, accounting for about two thirds of avoidable cancer deaths. For workplace cancer, they compare cancer rates in populations exposed to known workplace carcinogens with those of control populations. Doll and Peto also attack studies which have given higher estimates for occupational cancers as written for "political rather than scientific purposes".

A vociferous opponent of Doll and Peto and the leading proponent of occupational cancer rates as high as 40 per cent of total cancers is Samuel Epstein, a professor of occupational medicine at the University of Illinois. Epstein's purpose is avowedly political — to push governments to regulate occupational and environmental carcinogens. His 1979 book, *The Politics of Cancer*, is widely endorsed by the labor movement. Epstein accuses Doll and Peto and other advocates of lower occupational cancer rates of promoting the interests of the chemical industry against better regulation. These advocates of the "lifestyle cancer theory", he says, unjustly blame the victims who have little control over workplace carcinogens. While he agrees that smoking is a leading cause of cancer, Epstein argues that an overemphasis on smoking is used to divert attention from workplace carcinogens. Like Doll and Peto, Epstein claims that he follows sound epidemiological principles in deriving his estimate that as much as 40 per cent of cancer is caused by occupational exposure.

Dr. Robert Whiting, a research scientist specializing in occupational cancers at the Canadian Centre for Occupational Health and Safety, endorses the view that Doll and Peto's figure of approximately five per cent is the most widely accepted and reliable. Higher estimates like Epstein's err, he says, by failing to adequately consider factors such as smoking.

In Alberta, Dr. Orford also considers that a figure of five per cent or slightly less is reasonable. He further agrees with Harvard professor Weir's conclusion that occupational cancer is massively undercompensated and says that a similar analysis is applicable to Alberta. Of the approximately 3,000 annual cancer deaths in Alberta, Orford notes that only three at most are currently compensated. If five per cent or 150 of Alberta cancer deaths are occupational and only three are compensated, the compensation rate is about one in 50 — about one third the compensation rate for workplace cancers the Weir study found in Ontario.

Dr. Orford also confirms that one of the chief reasons for undercompensation is inadequate medical training in occupational health. "There is a recognition problem in the medical profession. Doctors don't recognize the connection between the workplace and cancer and often don't report occupa-

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Dr. Herbert Buchwald

tional cancers."

Dr. Buchwald favors a more conservative approach. He questions the validity of any figure in excess of five per cent saying that "many people, including the labor movement, blow the incidence of cancer in the workplace considerably out of proportion. Where there is a very clearly identified connection between the cancer and the specific carcinogen in the workplace environment, people are being compensated."

Dr. Buchwald adds that even where the connection between a cancer and a workplace carcinogen is clearly defined, the risk factor may be so small as to mitigate against expensive preventive measures being taken.

A recent cost-benefit analysis of health and safety measures by Martin Bailey, an economics professor at the University of Maryland, supports Dr. Buchwald's point of view. Bailey's calculations indicate that a program to eliminate highway railway crossings, for example, would cost $100,000 per human life saved, while implementing standards to reduce exposure to acrylonitrile, a workplace carcinogen, would cost over $624 million per human life saved. The implication is that scarce resources would be better spent on highway safety than on occupational health.

Labor advocates, however, criticize the application of cost-benefit analyses to occupational health and safety. Costs are born by management, while benefits accrue to workers. Moreover, since so little is known of the carcinogenicity of the estimated 60,000 chemicals in production, critics argue that risk assessments and cost-benefit analyses of workplace carcinogens are based on such inadequate data as to be worthless. In addition, since carcinogenic chemicals and lifestyle factors can all interact to increase the likelihood of cancer, they say that literally billions of tests should be performed to assess adequately occupational cancer risks.

A 1981 report on occupational health and safety by the Economic Council of Canada pointed out a further complicating factor in safeguarding against workplace carcinogens. Cancer typically has a long latency period — the time between contact with the carcinogen and the occurrence of the disease. With asbestos-caused cancers, for instance, latency periods as long as 40 years have been reported. Because of this, the council pointed out, it can be difficult to justify expenditure on safeguards in the present where uncertain health benefits will accrue only decades in the future, if at all.

Asbestos is a prime example of this. Scientific evidence of its carcinogenicity was available in the 1920s. But as the health problems were not immediately evident, no action was taken until the 1960s. Alberta, for instance, introduced its first asbestos-handling regulations only in 1968.

Despite these complicating factors and the lack of adequate information, decisions about dealing with workplace carcinogens and other occupational hazards must be taken in the present. Dr. Buchwald outlines some of the problems from the point of view of a government regulator: "On the one hand, industry says that nothing should be done unless benefits exceed costs. On the other hand, labor people say we can't measure the cost of human life and no outlay is too large to insure that human life is spared. Government has to walk a narrow line between these two extremes."

CONCLUSION

The stakes in occupational health and safety are high. A hazardous chemical can kill a worker or force a plant closure; a disabling accident can ruin both a farmer's health and his livelihood. It is perhaps because of these high stakes that emotion and ideology play so pervasive a role and cloud the issues. There is, for example, no agreement on such basic questions as to whether workplace diseases and accidents are increasing or decreasing. Labor advocates use government statistics to argue that both disabling injuries and occupational cancers have increased by 60 per cent or more in the past few years. Government regulators counter that these figures are a result of better reporting systems and that the situation is actually improving.

Such controversies over the most basic questions support the contention of the new study by the Canadian Centre for Occupational Health and Safety that the primary requirement right now is for comprehensive and unbiased information. In fact, our best hope for objective information and ultimately for fair occupational health and safety standards may lie with institutions like the centre which attempt to balance the competing political and economic interests of business, labor and government.

Paul Tisdall, a former journalist, is an Edmonton freelance writer who specializes in science writing

VIEWPOINT

Reg Basken

Reg Basken, executive assistant Energy and Chemical Workers Union, was the president of the Alberta Federation of Labor from 1972 to 1977 and has been actively interested in occupational health and safety for a number of years

While health and safety conditions in the world of work have been improved substantially over the past decade, there is still a great deal more to be done. The most obvious health hazards have been dealt with, but the challenge of the '80s, as I see it, will be to address the unseen hazards causing many illnesses not now reported as work-related.

In many cases, workers take time off for "the flu" or for headaches — common symptoms of exposure to a wide range of workplace hazards. These minor illnesses are not usually related to the workplace, but it just may be that the world of work is causing many illnesses not now reported as work-related.

It is still common for a worker to be told by the employer to take time off sick rather than to report to Workers' Compensation, particularly in non-union situations. This does several things. It keeps the number of accident or sickness claims at Workers' Compensation to a minimum and therefore reduces the employer's premium over the long haul. It also transfers the burden of paying at least partial salary to someone else, usually to an insurance company, frequently with the premiums paid by the workers themselves.

The government responsibility in this area is to broaden the number of illnesses which are compensible. Research must be done in the workplace to confirm that the less obvious illnesses are sometimes caused by the world of work. The employer's responsibility is to assist in the research and to follow the direction of improvements suggested by it. The worker's responsibility is to no longer allow questionable bouts of the flu or headaches to go unreported.

By M. KEOWN

The Occupational Health and Safety Act gives workers at least some right to refuse unsafe work which has to also include unhealthy work. Indeed, the worker has an obligation under the Act to refuse. The evidence, however, is overwhelming that workers do not refuse, whether out of fear or intimidation or simple inconvenience, and thousands of people involve themselves in unnecessary risk.

Shift work is an important source of stress and illness which has not been recognized as widely as it should be. As early as 1958, there have been published reports of links between shift work and health problems.

	Day Workers Per cent	Shift Workers Per cent
Gastric problems	10.8	35.0
Confirmed ulcers	7.7	13.4
Intestinal problems	9.0	30.0
Nervous problems	25.0	64.0

Source: Industrial Medicine and Surgery, October 1958, pp. 493-497.

In 1979 a study released by the West German Ministry in the State of North Rhine-Westphalia found that of 2,750 shift workers studied, 34 per cent suffered from stomach complaints, 53 per cent suffered from loss of appetite. Shift workers are also eight times more likely to suffer from gastric ulcers than day workers. Another 1979 study by Professor Marcel Simard of the University of Montreal revealed 25 per cent of rotating shift workers experienced digestive disorders as opposed to 12 per cent of day workers. Also, 18 per cent of the shift workers suffered from gastric ulcers compared to five per cent of the day workers.

We are not talking about idle complaints from workers or their unions. There are tremendous costs to society that should be of interest to everyone, including: high medical costs to treat physical and mental ailments associated with shift work; increased stress felt within the families of shift workers; and reduced participation by shift workers in the community. One of the most important features of shift work may be the loss to the community because the shift worker cannot make a full contribution to society.

While it is obvious that shift work is here to stay, that should not stop us from trying to make it healthy, comfortable and as productive as possible. That probably means changing the current patterns of shift rotation was well as solving the health problems that are so clearly associated with shift work.

Occupational health problems are not confined to blue collar workers, a fact which has recently been receiving attention from the media and from workers themselves. The office environment is the newest attention-getter in the occupational health and safety field, with increasing evidence linking both minor and major health problems to such factors as lighting, air conditioning and the newer technology of photocopiers and video display terminals.

Workers, management and government must all look beyond the obvious to extend the highest standards of community health to the workplace. We owe it to ourselves, and to do anything less is really a crime against humanity.

Jim Wilson

Indoor Air Quality

A "chemical soup" in our homes and workplaces.

Newer highrise office buildings are tightly sealed, keeping heat (and pollutants) in

SUSAN BRUN

UNIVERSITY OF CALGARY

Dr. Val Geist

It's beginning to look as though it might almost be better to breathe bottled smog in your highrise office or your home than to be exposed to the recirculated stuff most buildings provide for their inhabitants. Almost.

What we get to breathe in virtually every building that exists is a "chemical soup" according to University of Calgary environmental design professor Val Geist.

"Only under exceptional circumstances can you have better air indoors than you can get outside," Geist says. "Usually — in fact virtually always — it's worse inside."

And "worse" can be scary, at least in the sense of how *much* polluted air we inhale or are otherwise exposed to every day. How *harmful* it is is an area fraught with emotional, scientific and economic argument. And unlike outdoor air, few regulations exist to aid or control its quality.

"In the workplace, building materials, machinery, cleaning utensils and solutions — anything that can gas out is a potential problem," Geist says. "The same goes for our houses."

(A substance "gases out" if it contains either gaseous materials or chemicals which combine with the air, water or other chemicals to create gases — and if, as is commonly the case, the gases slowly migrate out of the substance.)

Such unpleasantries as dead skin cells, mucus, spittle, and disease germs have been found in abundant quantities by researchers checking the air flowing through office and household air ducts. As Geist points out, this is all added to the air taken into the building from the outside — air which may already be polluted.

The actual amount of polluting materials will vary from place to place, and their affect will depend on both the length of exposure and the specific sensitivity of the individual to each substance. But the list of materials that affect the quality of indoor air seems almost endless.

Solvents used in many cleaners, glues and other household and office procedures outgas vapors which can cause dizziness, fatigue, eye irritations and other problems.

Formaldehyde is outgased in many buildings from construction materials including particleboard, carpet glues, urea formaldehyde insulation and even carbonless paper. It can cause a number of irritations to the skin and eyes.

Even the ubiquitous office photocopier can create a somewhat hostile air environment. Many copiers emit ozone, which can create eye and throat irritation or headaches following lengthy exposure. The same problem can arise from many other electrical tools —and also from electrical shorts. And nitropyrene, a constituent of some photocopier toners (the black "ink") is a suspected carcinogen.

Your next-desk neighbor's smoking habit can deliver almost as many pollutants to your lungs as it does to the smoker's. They

BILL McKEOWN

Frank Cass

BILL McKEOWN

Goldie Edworthy

can cause various eye and throat irritations – and cancer, even for the non-smoker.

There are special hazards posed by some humidifying systems. Bacteria and fungi thriving in stagnant water can cause eye infections, cold symptoms, bronchitis, chills, fever and joint and muscle pains. In fact, Dr. John Orpin, a federal health department researcher, believes that much of what we label "flu" may in fact be "humifidier disease."

Most of the ailments spread in this way are minor. However, the outbreak of Legionnaire's Disease in 1976 which claimed the lives of 29 convention delegates was linked to bacteria which was probably circulated through a contaminated air-conditioning and humdifying system.

Orpin recommends frequent cleaning of humidifiers with a mixture of water and chlorine disinfectant.

Some acoustic tiles, insulation, various lining materials and other building structural materials in older buildings contain generous quantities of asbestos, which has numerous cancer links.

Nitrous oxides, carbon monoxide and sulphur dioxide are only a few of the nasty gases which result from heating fuels and car exhaust. They produce nausea, headaches, eye, nose and throat irritations.

This is only the short list; every scientist studying indoor air quality seems to have one or two more favorites to add. And not enough is known about synergistic effects indoor air pollutants (or outdoor pollutants) may exert when they are combined.

But how significant is indoor pollution? Why haven't we been bombarded by concerns and regulations about air quality in the home, when there are at least some regulations attached to any workplace when known hazardous materials are being handled?

"It's one of those unknown areas," says Geist. "And it's not a nice, clear-cut field to work in. It depends so much on the age of the building, its materials, its location — and in particular, the sensitivity of the individual."

About five per cent of the population, he says, is considered "very sensitive" to the pollutants that affect indoor air quality. A further 20 per cent are "quite sensitive" and the rest of us are lucky. And the problems involved change from person to person, even within the same building.

The growing number of indoor air specialists all agree that the best "solution", no matter what the problem is, is to insist on adequate ventilation standards for all buildings — and even for each *room* in those buildings.

Frank Cass, mechanical superintendent in Alberta Labor's building standards branch, says the province's ventilation standards are in fact quite specific.

"Depending on the type of occupancy," Cass says, "the quantity of fresh outdoor air required in a building ranges from five cubic feet per minute per person to as much as 30 cubic feet per minute per person in places like bars where there are a lot of people and heavy smoking."

However, while a building's original design may have fulfilled these requirements, later alterations may have inadvertently and significantly impaired ventilation capacity. And due to lack of manpower and budget limitations, follow-up provincial or city inspections are very infrequent.

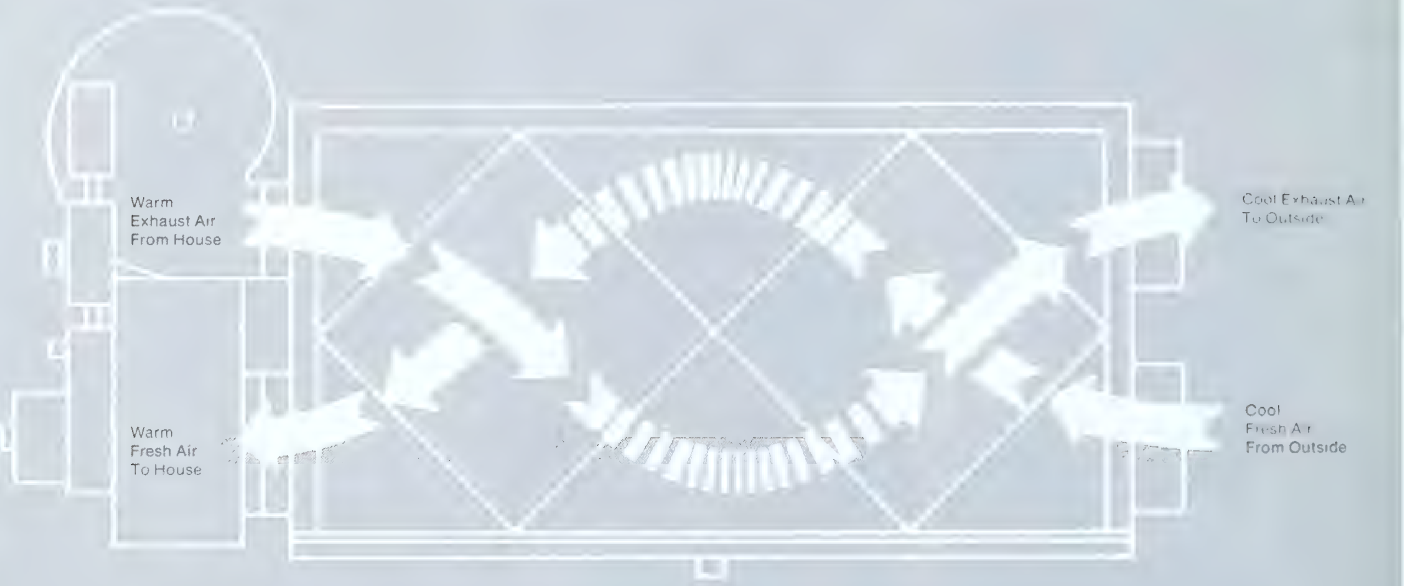
A major problem in today's newer buildings, Cass adds, is that they're designed in an open-area format, with entire floors built without interior walls. And that's all the building's ventilation systems are designed for. When tenants add walls for coffee areas and boardrooms they create oases of terrible ventilation because the system wasn't designed to cope with walls.

Older buildings are usually better in terms of ventilation than newer ones, he says, simply because they have windows that people can — and do — open. "New buildings are sealed tight for their air condition-

Bill McKEOWN

One particularly hazardous substance found in many workplaces is cigarette smoke

AN AIR-TO-AIR HEAT EXCHANGER



Conservation Energy Systems Ltd. Used by permission of [illegible]

ing and energy efficiency systems. And at that point the quality of the air in the buildings is extremely dependent on the quality of their ventilation systems."

But what of houses, which are increasingly becoming sealed as tightly as technology, and the bank account, will permit?

Since we spend much more time in the home than in the office — up to 70 per cent of our day in fact — even the threshold exposure levels permitted for some pollutants in the office or outdoor environment can be too high.

"The more energy efficient you make your house, the more likelihood there is that there will be a buildup of pollutants," says Goldie Edworthy, an energy conservation officer with Alberta Energy and Natural Resources. There's a build-up of radon and its (radioactive) daughter products from the building's inside walls and other natural materials. The furniture and drywalling and several other structural materials may create build-ups of formaldehyde. Heating systems may create nitrous oxide and other gas build-ups that are harmful. In fact everything gets worse in that sealed up space. Natural gas appliances are among the worst sources of indoor pollutants, and in fact you might want to avoid them as much as possible in an energy-efficient house.

"At the very least," says Edworthy, "you need to have frequent air exchanges if you seal up your home."

Unfortunately, he says, little attention has really been paid to ventilation in most houses. And one of the more worrisome newfangled inventions to his mind is the modern version of the kerosene heater, which really came into vogue only this past winter.

"In a confined space with closed doors and windows you can reach quite high levels of pollutants very quickly," he says. "The same is true for wood-burning stoves, but the result isn't always as serious. We would at least like to see — particularly for kerosene systems — a design that draws air in from outside."

And while there's been little research in North America into how frequently the air in a house should be completely exchanged with outside air, Edworthy says Sweden requires one-half air exchange per hour, under normal circumstances.

One recommended air exchange system is an air-to-air heat exchanger, a sheet metal installation where warm air from the interior of the house is vented outside through a series of veined channels running parallel to a similar series of channels which draw cooler outdoor air inside. The incoming air absorbs much of the heat from the outgoing air, minimizing energy loss.

But even if (1) we accept that there's a problem with indoor air quality, and (2) we accept that ventilation is an absolute requirement, we're still faced with two problems: the air we pull in from outside is, after all, only as clean as the outdoor air; and, how do we regulate general air quality in office buildings and (even more difficult) in homes?

"Ventilation air from the outside is normally considered acceptable in its purity," says Frank Cass. "We're not ignoring the reality of the problems that arise when an inversion layer holds the pollutants tightly over the city. When that happens of course, the air we draw into a building can be pretty dirty stuff. But that doesn't really happen very much in Alberta. In the smaller communities it almost never becomes a problem and in Calgary it happens a bit more often than in Edmonton. Mostly though, we have pretty good outside air."

There have been situations, though, Cass says, where Alberta hospitals have had to take measures to purify outdoor air because of special medical requirements — and he expects some industries have had to take similar measures.

"But the costs of cleaning air are enormously high, and we have to realistically weigh that cost against the number of days cleaning might actually be required," he says. While the home situation isn't very controlled, he says there are a few regulations. For all heating systems except boiler heating, for instance, it's necessary to have a fresh air duct coming in directly to the furnace. "That's generally enough," Cass says, although he admits in some circumstances it would be useful if regulations required more. "But with any code you need a reasonable approach. There's no purpose in having a code that makes it too expensive to build a house or building, or too expensive to rent it out."

How can you tell if you're being affected by poor indoor air quality? The symptom descriptions are to say the least, mushy.

"People feel drowsy, not quite right - not operating at 100 per cent capacity," says the U of C's Geist.

"Headaches, a feeling of living in dead air, a feeling of general discomfort," says Frank Cass.

In other words, the same symptoms that can indicate a host of other physical problems.

But in the office, watch for a lot of general staff illnesses and what's frequently called "Monday morning blahs" — an uncomfortable, lethargic feeling that overcomes workers when they return to office air after a weekend home.

ALBERTA GOVERNMENT PHOTO

And both at home and in the office, look for buildups of moisture or ice or mold, which indicate a sealed building with too much water vapor floating about, and too little ventilation to circulate or remove it.

What should you do if you suspect air quality problems? At work, it becomes an occupational health problem which must be dealt with by supervisors, union leaders or provincial government agencies. At home, it's both easier and more difficult to deal with.

"If you suspect you're sensitive to this sort of thing, and exposed to too much bothersome material, it's important to reduce the polution load," Geist says. "If it's a mild problem it's probably not too difficult to deal with. Get out into the fresh air as often as possible. And create a pollution-free area in your house. The bedroom is usually a good place."

You might also seek a medical practitioner who specializes in pollution ailments, although Geist says he knows of none in Alberta and only two in B.C. Some office buildings, he says, (again none in Alberta) have recognized the problem and provide carefully-ventilated pollution-free rooms to which pollution-sensitive people may go for a time of restoration.

And lest those of us who are not among Geist's sensitive 25 per cent of the population become too complacent, he offers this warning: "There are just too many pollutants around us today. And it's not unrealistic to expect that people can become sensitized to pollutants like they can to bee stings. With heavy exposure, we can lose our toughness."

Jim Wilson, marketing co-ordinator for the Calgary engineering firm of Reid Crowther and Partners Ltd., is a freelance journalist.

Norma Ramage

VDT Blues

A labor-saving device or a threat?

Evelyn Lofty is worried.

A word processor operator at the Southern Alberta Institute of Technology in Calgary, Lofty is also seven months pregnant with her first child. She's worried that the video display terminal (VDT) she uses may give off radiation that could cause biological damage to her unborn baby.

She has read a lot of newspaper stories about the radiation dangers of VDTs, both pro and con, and she's confused about whether or not the machine is a health hazard. But she's not taking any chances. She's wearing a lead vest because, as she says, "Why jeopardize something you'll have to live with for a lifetime?"

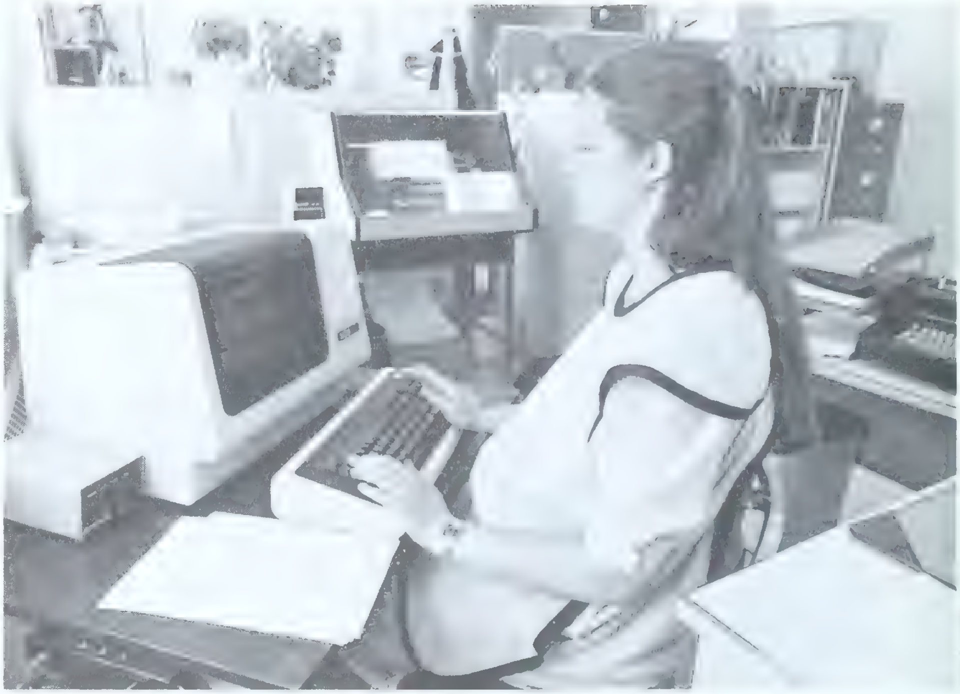
Dr. Robert Orford, executive director of Occupational Health Services, says that the lead apron approach may be more harmful than beneficial. He says the apron would be of "absolutely no value" for a VDT operator and, in theory, it could raise the temperature within the uterus, known to have harmful effects on the fetus.

Her confusion, her concern, her fear, are not unique to her. The widespread use of VDTs is part of a microtechnological revolution that has changed the face of Canada and the western world in the last decade.

Although microtechnology refers to any machine using micro circuitry — assembly line robots, video games and microwave ovens — it is the VDT, that ubiquitous TV screen and attached keyboard, that has had the biggest impact and stirred up the most concern, confusion and downright hatred.

Also called a cathode ray tube, the machine is everywhere, in offices, newsrooms, telephone offices, travel agencies and airports. Conservative estimates put the number of VDTs in Canada at over a quarter million and the Canadian Labor Congress estimates as many as 700,000 people every day spend some time on a VDT.

Designed to get the job done faster and more efficiently, VDTs have been hailed by some as the greatest invention since the typewriter but have met with ingrained hostility from others. Hard on the heels of the VDTs' introduction have come a spate of reports linking it to health hazards such as birth defects, cataracts, muscular problems and psychological stress.



Evelyn Lofty

The health issue breaks down into three categories: radiation, stress and ergonomics, the range of problems involved in the interaction between man and machine.

It is the first of these problems that has caused the most concern and grabbed the biggest headlines. The fear is that low level ionizing radiation emitted by VDTs is responsible for a cluster of health problems including a high incidence of miscarriages, birth defects and other pregnancy problems among VDT users as well as cases of cataracts and other eyes diseases.

Ionizing radiation, such as X-rays, are known to have an effect on living cells, agrees Brian Phillips of the Alberta Occupational Health and Safety Division. And "theoretically" VDTs can emit X-rays. But, says Phillips, even the most sophisticated measuring devices have failed to show anything other than "negligible" radiation levels.

Prestigious agencies such as the U.S. Food and Drug Administration and Health and Welfare Canada have conducted tests on VDTs and concluded there is no evidence linking VDTs with birth defects.

P.J. Waight, chief of consumer and clinical radiation hazards for Health and Welfare Canada, went so far as to say after a 1982 test on 300 VDTs that: "There is no justification for monitoring VDTs or people or for instituting any protection for the operator."

Phillips says that any radiation emitted by VDTs is considerably lower than a person would get every year from the background environment.

"Each year a person gets between 100 and 150 millirens of radiation from things like food, building materials, cosmic radiation and fallout in the atmosphere. Compared to that, a VDT operator in a year is probably not exposed to more than one to 10 millirens and most likely one milliren is the more accurate figure."

But Phillips says there is still an area of controversy and that is over the non-ionizing radiation that could possibly be emitted by VDTs.

Karel Marha of the Canadian Centre for Occupational Health and Safety says more information must be obtained about this non-ionizing radiation before VDTs can be pronounced safe. Non-ionizing radiation — the areas of the electromagnetic spectrum covered by infrared and microwave radiations among others — may have biological effects previously unsuspected.

Says Phillips: "We're only now starting to investigate these effects and the whole thing is still in the argumentative, speculative stage."

But there are those who are convinced there is no safe level of radiation. They point to asbestos workers at the turn of the century who were exposed to "acceptable" levels of asbestos fibres. A few years later many were found to be suffering from asbestosis, a lung disease caused by inhalation of fine asbestos fibres, and standards have been dramatically increased.

Susan Ruffo, health and safety technical assistant of the Alberta Union of Public Employees, says radiation dangers are "one of those grey areas but our union has taken the position we're not convinced studies have definitely shown VDTs are *not* connected with birth defects or cataracts."

Ruffo's position is supported by reports of some startling "coincidences" such as the following reported to the 1982 Labor Canada task force on micro-electronics and employment:

Seven out of 13 pregnant VDT operators at Dorval airport in February, 1981 miscarried;

In 1981, out of six pregnant VDT operators at Surrey Municipal Hospital in B.C., two miscarried and of the four babies carried to full term, only one was normal;

A report that four of seven pregnant operators in the classified ad department of the Toronto Star gave birth to babies with congenital birth defects.

BILL McKEOWN

Brian Phillips

After hearing these examples coupled with negative tests on VDTs, the task force admitted it was in a "quandary". However, it concluded that "since we know very little about the potential long-term effects of exposure to low-level radiation, it would be best to reduce avoidable X-ray exposure to an absolute minimum, on the assumption that no level of exposure is absolutely safe."

The effect of radiation on cataracts and eye disease is another area of contention although it has not grabbed the media headlines.

But Roland Bauder, a Calgary optometrist and chairman of the Alberta Optometric Association's occupational vision committee, says he is not convinced there is any concrete evidence linking the two.

"Every person has cataracts in his eyes to some degree or another, many of them there since birth. So if a VDT operator comes to me and I find a cataract, can I say it was caused by the VDT or that it was caused by something else or that it was there from birth?"

BILL McKEOWN

Susan Ruffo

Phillips says the formation of cataracts would require hundreds of times the radiation level given off by VDTs.

Both Bauder and Phillips agree much of the radiation scare arises from ignorance of VDTs and computer technology.

Says Phillips: "We see radiation in only a negative light because of the anti-nuclear lobby. Radiation and nuclear war all get rolled into one and the answer is no, no, it's nasty.

"And I suppose it's the impact of any new technology. When the steam engine was invented, Victorians thought they would get sucked out of the carriages when the trains hurtled along at 30 miles per hour. They didn't understand the technology."

While Ruffo agrees ignorance is a problem, her big concern is that the media hype over the radiation issue may have blinded people to more immediate — and provable — health hazards of VDTs.

And one "really big problem" is the stress caused by the machines, she says. Workers

BILL McKEOWN

Dr. Jim Cheng

are afraid VDTs and other microtechnological marvels such as assembly line robots, will eventually replace them. They envision a kind of Orwellian 1984 society where mankind is reduced to the alpha managers and the epsilon button pushers with nothing in between.

This fear is particularly acute among women, who make up the bulk of the work force using VDTs. Heather Menzies writes in her book "Women and the Chip" that women workers are on a "collision course" with microtechnology.

And their fears may be justified. European studies quoted in a 1980 Science Council of Canada report estimated that 25 per cent of office workers in Europe could be put out of work by VDTs by the end of this decade.

But the fear of "de-skilling", of having their work reduced to endless keypunching is often blown out of proportion, says Dr. Jim Cheng, former director of medical services in the Occupational Health and Safety Division.

"There's a lot of mystique about computers. People are afraid of the machine because they are afraid the machines are smarter than they are."

Employers are to blame for some of this trauma, says Dr. Cheng, because they treat VDTs as something different rather than as just another office tool.

First of all, they may isolate the VDT operator in a separate room. The result is stress because the operator sees no one all day, just the machine.

Or they may fail to realize that anyone can be taught to use a VDT, says Dr. Cheng, and instead hire one person whose exclusive job is VDT operator. Then, instead of doing a variety of things every day, the employee is reduced to repeating the same task over and over again, as in the case of the postal clerk who spends eight hours every day punching postal codes into a VDT.

The result, says Dr. Cheng, is more stress, the kind identified over a decade ago among assembly line workers.

"It's really nothing new," he says, "simply an old problem in a new guise."

What is new, says Ruffo, is the stress caused by the monitoring capabilities of some machines such as cash registers and word processors that keep track of how fast the operator works or the number of mistakes she makes.

Often the VDT operator's stress manifests itself in a variety of physical symptoms such as headaches, backaches, eye strain and fatigue as well as secondary problems such as increased drug and alcohol use, nervous breakdowns and marital problems.

It is sometimes difficult, however, to separate the problems caused by stress from those caused by ergonomics, or the relationship of the worker to the machine.

One of the best documented hazards of working with VDTs is eye strain and related visual problems. A 1982 study by the Canadian Labour Congress found that 22 per cent of VDT operators, compared with six per cent of non-operators, reported problems such as burning eyes, aching eyes, blurred vision and an inability to distinguish colors.

Bauder believes there are two distinct kinds of eye problems suffered by VDT users, one kind similar to those experienced by anyone doing close work and another specific to VDT users.

Problems such as eye strain are endemic to those doing close work — accountants working continually with columns of figures, for example.

Some people report VDTs have made their vision worse to the point where they need glasses. Often, says Bauder, the problem has been there for a long time but the strain of close work on the VDT has accelerated it.

But there is a group of eye problems he believes is related directly to the VDT use. One of these is the bleaching or loss of color

vision, sometimes so severe a sufferer cannot differentiate between red and green traffic lights.

"If a person is concentrating on grey letters on a black VDT screen she may bleach out the green photo receptors in the eye. Then instead of the blue, green and red receptors triggering at the same time to give a full spectrum, she can't tell the difference between red and green."

Another common problem is blurred vision and eye strain caused by overhead lights reflecting off the VDT screen. But technological advances are helping to reduce such problems. Manufacturers are experimenting with a rainbow hue of screen colors and developing special coatings and screens to cut glare.

Technology is also helping to ease some of the muscle and back problems caused by VDT use.

Many operators used to suffer neck and back pain because VDTs were not adjustable, explains Dr. Cheng.

"Typewriters could be moved to suit the operator but the early VDTs were immovable."

But more and more VDTs have screen and keyboard separate so each can be adjusted to the operator's convenience. Special tables have been developed which can be lowered or raised to the most comfortable height. Improvements in the screens' resolution have also eased eye strain, says Dr. Cheng, and the improvements keep coming.

"It's a consumer's market. People will buy what is comfortable for them and the company that wants to compete will produce it."

In addition, new programs developed by employers like the University of Alberta are helping to alleviate problems.

Robert White, director of occupational health and safety at U of A, says his department now recommends that VDT operators take a 10-minute rest break away from the machine every hour; that they rotate jobs so that all an employee's time isn't spent at the VDT; and that the university purchase machines where keyboards and screen are separate and adjustable.

"We also recommend eye exercises to help prevent eye strain and urge operators to check regularly with eye care professionals," says White.

But despite the technological advances, despite the education programs and despite the tests that show no radiation hazards, a lot of people are still confused and frightened by VDTs.

Perhaps the only solution to the problem is the one suggested by Brian Phillips:

"This is a new technology and maybe we'll have to wait until we have a whole new generation who have grown up with the VDT and who accept them and aren't afraid of them."

Norma Ramage is a Calgary journalism instructor and freelance writer

Ron Duffy

The Home Environment

Hazards of the homestead

OK GANG LET'S GET 'EM!

Whoever first used the expression "safe as houses" was a dreamer. Beware: In all their 300,000 years of history and prehistory houses have never been safe. The Enemy has always been out there and has always found a way inside.

At the turn of the century the sudden growth of the Canadian population through immigration exerted pressure on the rapidly growing cities of central Canada to provide housing. This led to widespread land speculation by real estate promoters, to high rents and to what was probably the worst housing conditions southern Canadians have ever experienced: overcrowding, no plumbing, poor ventilation.

"The discovery during the First World War that the health and physical development of the urban poor did not meet the minimum standards for military service was a major shock to government officials," writes John Archer, a CMHC projects manager.

Housing reformers argued that the poor were being made sick by the housing conditions they were forced to endure. To be cured they required safe, clean, decent housing. So be it. The uniform code for building construction developed between the wars by the National Research Council, the rise in Canada of the American "City Beautiful" movement, the National Housing Act of 1945 and the Canadian Mortgage and Housing Corporation of 1946 all helped to create the clean, decent housing demanded by the reformers.

But is it safe? No, not really.

The Enemy has infiltrated our modern-day castles using a traitorous Fifth Column code-named Careless. The busiest and deadliest of all the agents pressed into service against us, Careless in our homes is estimated to be responsible for as much as 70 per cent of all accidents that befall us, either indoors or out. The Ontario Ministry of Health reported that in 1977 141,130 residents of the province had to seek medical care after sustaining accidents at home. The total cost in wages, fire-loss and medical expenses was more than $292 million.

"Next to motor vehicles," the Canada Safety Council commented on its 1980 statistics, "the home accounts for most of the fatal accidents. Of the 5,321 non-transport accident fatalities, 1,989 or 37.4 per cent occurred in the home and falls, fires, poisoning and suffocation accounted for 1,749 or 87.9 per cent of these."

Careless operators in our homes delight in misplacing scatter rugs, dimming lights, stretching electric cords across corridors, leaving objects on stairs. Their aim: to cause falls.

Of 1,989 accidental deaths in Canadian homes in 1980 714 were from falls. And no one is immune. John Glenn safely orbited the earth, then fell in his own bathroom and gave himself a bad inner-ear injury.

Some Careless agents are firebugs. They sneak around the house, usually at night —60 per cent of domestic fires occur between 10 pm and 6 am — overloading electric circuits, damaging and baring electric cords, leaving burning cigarettes around — they love unextinguished cigarettes. The result of their nefarious activities in 1980 was that 80 per cent of all fire fatalities, 598 out of 747, occurred in our homes.

Careless agents love poisons as much as they love unstubbed cigarettes and here as elsewhere they display their callous brutality.

They leave many of the innocuous-looking but potentially deadly everyday household products within easy and enticing reach of toddlers and young children. The Consumers' Association of Canada reports that each year a staggering 30,000 infant-to-four-year-olds suffer poisoning from sampling the contents of medicine cabinets, kitchen cupboards and purses. In a typical year ten of them die.

STOP! THAT MAY BE BAD FOR YOU TOO!
UNHEALTHY THINGS SEEKING AGENCY

The Enemy can attack when we least expect it. For example, the recently-expanded enthusiasm for arts and crafts activities brought with it a poisonous and lethal array of toxic acids, heavy metals, adhesives and fibres. So successful has this new Enemy activity become, our own agents in the field have had to produce a bulletin titled *Art Hazard News* to keep us informed about potential dangers.

The list so far uncovered is unfortunately long. Benzene, a solvent used in photolithography, painting, printing and textile-dyeing is known to be a carcinogen. Heavy metals used to colour glass — antimony (also used in pewter), arsenic, uranium, chromium, and nickel — can be speedy toxins.

Jewelry making is reported to be the most hazardous hobby, followed by enamelling, glass and crystal working, painting and printing, lapidary work, textile-dyeing and sculpture.

Old houses used to leak like sieves. Faced with rocketing fuel prices a decade ago, we swapped ventilation for energy conservation. Before then the air in a typical house changed at least once an hour. Many modern energy-efficient houses allow an exchange of air only once in six to ten hours. Sometimes longer. The result is a build up of dangerously high levels of humidity, odors and pollutants.

The list of pollutants is long and terrifying: morpholine from furniture polish, hydrated aluminum chloride from deodorants; vinyl-acetate-copolymer resins from hair sprays; formaldehyde from panel-boards, carpet adhesives and the notorious and controversial foam insulation; and the less controversial and more certainly noxious carbon monoxide from cigarettes and from oxygen-starved furnaces, gas ranges and open fireplaces. In modern airtight homes these and other pollutants — smoke, fumes, gas and germs — move in and stay like squatters with names from science fiction magazines.

According to one World Health Organization expert, "Indoor pollution is already doing more damage to human health than the outdoor pollution which regulatory authorities are fighting against throughout the industrialized world."

[illegible]
Canada last year Cleaning products and s[illegible]
should be well away from children's reach

Some alarmed Europeans have tried to establish domestic ventilation standards. But standards are as difficult to establish as to enforce. The size of houses varies. So does the number of occupants, their behaviour and habits. Do they smoke? How physically active are they? Do they own many oxygen-using or air-conditioning appliances? Do they maintain their appliances properly? How often do they open outside doors? Lifestyle, education and attitudes thus determine the quality of air in the home environment (See Indoor Air Quality in this issue).

Demands for lifestyle convenience or for prestige have turned the modern house into a hermetically sealed box of technological marvels. Television and stereos threaten to make vocal chords, musical instruments and minds obsolete. Gas and electric ranges and furnaces have relegated woodburning stoves to the pages of history or Harrowsmith, vacuum cleaners have swept the broom and the carpet beater out the door, and cool-cooking microwave ovens have become hot sellers.

The Enemy has been eagerly waiting to exploit this situation in its war against the safety of the home environment. But, as in any war situation, a note of hysteria might be sounding in intelligence reports put out by the media.

The word that triggers more of this hysteria than any other is "radiation". We have even set up an international organization to study the bio-effects of new radiation. Our domestic technology produces two kinds of radiation — an ionizing type (possibly car-

SUSAN BRLN

Headphones may spare bystanders from exposure to loud music, but pose safety hazards of their own.

cinogenic) and a non-ionizing type — that seep into every room in the house. Smoke detectors, burglar alarms, luminous clocks, CB radios, kitchen ranges, drinking water, dinnerware, fluorescent lights, black lights, sun lamps, television sets, home computers, microwave ovens: the list of radiation sources seems endless, and the fear generated by media reports of cancer-causing doses seems to play into the hands of the Enemy.

Fortunately, the levels of radiation emitted by most of these sources is very low. John Wetherill, director of the provincial Occupational Health and Safety Services' radiation health branch, says there is no cause for concern.

There is some controversy, however, about the threat to health posed by radon, a gas which is emitted naturally small in quantities from certain elements in soil and rock.

Although radioactive — it derives from the decay of radium, actinium or thorium – radon itself is not especially dangerous, but linked to dust particles that can lodge in the lungs, its charged "daughter products" are.

According to one expert, David Rosenbaum of the U.S. Environmental Protection Agency, "The available data suggest that some 10 per cent of lung cancers in the U.S. are now caused by indoor radon."

But it takes a relatively rare set of conditions for this to happen. Media exaggeration of the results of radiation research has raised unnecessary fear in public minds.

"It is our task to dispel this fear," says John Wetherill. "I'd much rather see attention focussed on the really dangerous aspects of the home environment — those that *do* cause death and injury."

"Environmental (health) hazards are diffuse and difficult to analyze," researchers from the American Center for Science in the Public Interest maintain. "Moved around as they are by the currents of air and water, even their physical presence is hard to appraise. Many are invisible and odorless. Many of the hazards, such as noise, work their effects so slowly that the victims are usually in their later years and are restrained by long habit from moving away or making an active protest."

Noise, in this respect, is one of the most insidious of secret weapons ranged against us. By the time we reach the age of 55, 22 per cent of us suffer some hearing loss. And usually we help to bring it upon ourselves by filling our homes with noisy appliances, stereos, television sets, toys, and power tools.

Sheldon Cohen of the University of Oregon and Neil Weinstein of Rutgers University have written that noise can alter physiological processes including the functioning of the cardiovascular, endocrine, respiratory and digestive systems. "Since such changes, if extreme, are often considered potentially hazardous to health, many feel that pathogenic effects of prolonged noise exposure are likely."

The average person can safely tolerate lengthy exposure to 80 decibels (dBA), some up to 100. A vacuum cleaner or a dishwasher may seem safe at around 70 dB, but a lot depends on the size of the space in which the noise occurs and the length of exposure to it. According to occupational health and safety experts, the maximum safe exposure time at 85 dBA is eight hours; at 115 dBA it's only fifteen minutes. Noise levels in a disco may reach between 100 and 120 dBA. Parents' warning to teenage rock fans to turn down the volume might be falling on deaf ears.

To continue with the Enemy Within metaphor, it looks as though defending our castles is largely a matter of education. Forewarned is forearmed — a knowledge of the hazards and their remedies will go a long way to preventing domestic accidents and illnesses.

Ron Duffy is a former geography lecturer and researcher, now doing freelance writing and research

Tom Shand

Occupational Health Standards

Regulations must be bolstered by education

When a scaffolding falls, you know instantly. But the health effects of a badly ventilated office or factory may not be known for years. And even then, it is most difficult to prove a worker's illness is work-related.

For this reason, setting and enforcing occupational regulations for health hazards is much more complex and difficult than for safety hazards.

"The health aspect of occupations has been a very junior partner to safety," says Dr. C.J. Varvis, past president of the Alberta Medical Association and a member of the Gale Industrial Health and Safety Commission. "Safety violations are much easier to see and the tradition of safety regulations was carried over from the Worker's Compensation Board (WCB) and the whole plan of insurance."

However, tremendous strides have been taken since the Gale Commission recommended in 1975 that a single government body be responsible for occupational health and safety in Alberta. Then, in 1976, the Occupational Health and Safety Act (OHS Act) was established and the numerous safety regulations which had been administered by the WCB and occupational health regulations administered by the provincial Board of Health, were transferred to it. First set up as a division of the Alberta Labor, it was given autonomy in 1979.

"Things came together at about the right time," says Dr. Varvis. "Attention to occupational health and safety is needed most in highly industrialized provinces and, in 1976, industry was just coming into Alberta."

He added that the division was intended to expand and that being given its own ministry was a major step forward. With that came autonomy, a bigger budget and the ability to establish its own priorities.

"The Gale Commission also made some important recommendations for occupational health, which we've tried to implement," says Dr. Herbert Buchwald, managing director of the Occupational Health and Safety Division of Alberta Workers' Health Safety and Compensation. Subsequently, the number of people employed in Occupational Health Services has expanded from about 20 in 1975 to more than 70 now.

According to Alberta OHS legislative affairs co-ordinator George Bryce, there is more attention now being given to the health aspect of occupational health and safety than ever before in Alberta. This can be seen by increases in media interest, in the number of diseases recognized by the WCB as work-related and in new regulations.

Currently, there are separate sets of OHS regulations governing chemical hazards, noise, asbestos, silica and vinyl chloride, with regulations on coal dust, ventilation and sanitary facilities in the making. The latter three are partially covered in existing regulations but require updating to conform to occupational health.

The regulations and the OHS Act are drawn up by government, with input from labor and industry. Basically, the Act specifies the responsibilities and rights of employers, with respect to occupational health and safety, as well as the role and powers of government to regulate, monitor and enforce. However, it is the regulations that set the standards and specify, in detail, the requirements and specifications to be met.

For example, the Act says that written reports must be submitted on any "designated substances" used, stored or manufactured on any work site. The Chemical Hazard Regulations list about 600 potentially harmful substances, which covers several thousand industrial formulations.

It also specifies the maximum exposure allowed to each substance, based on a lifetime of eight-hour days. For many, there is also a maximum 15-minute exposure. These limits are adopted mainly from the American Conference of Governmental Hygienists which is, according to Buchwald, accepted as being the most reliable source in North America in this area of study.

"However," as Bryce points out, "although we have enough regulations for what information we have, we require more study, information and evaluation. There is more study being done than ever before, but there can never be enough."

Dr. Varvis agrees, particularly in reference to the petrochemical industry.

"The petrochemical industry is probably the most difficult to monitor," he says. "Situations occur in the industry that could have a time bomb effect. Substances created and used alone or in combination could have the potential to cause disease five to 10 years down the road and we're not even aware of it now. We must know what the product is, what it does and how to use it. One of the biggest concerns the medical community has is that something we do or use in everyday life and think is safe is actually unsafe."

He added, however, that to the best of his knowledge "the medical community is not in conflict at all with the standards set by the (OHS) department. The people who advised the department were logical and so are the standards."

Government officials are also quick to point out that standards are not based solely on scientific evidence.

"It is the job of the civil service to provide all possible information," says Bryce. "But regulations in the final analysis are a political decision. There are always certain risks and tradeoffs society has to make. The scientific evidence can be stacked up but the politician still has many soft variables to deal with, such as public reaction, the cost to industry and pressure from lobby groups such as labor unions."

BILL McKEOWN

Dr. C.J. Varvis

Basically, the unions feel the Act does not do enough to protect the workers while employers are too often allowed to carry on with unsafe and unhealthy practices.

Industry, on the other hand, says that workers and unions often bring their problems upon themselves by not taking advantage of available protective devices then blaming industry.

Merv Ellis, administrator of the Alberta Construction Association, which represents employers in the construction industry, says legislation is not the answer to occupational health and safety problems.

"Industry, government and unions need to find highly motivated people to educate workers to look after themselves and to show employers that good safety and health are good production. I can't think of an instance where better safety and health doesn't pay.

"The OHS Act should consist of two clauses: 1) An employer can't force a worker to endanger himself and 2) A worker can't endanger others. And finally, we must legislate responsibilities. The unions are pressuring OHS for more control over the worksite, lobbying for rights. But you can't have rights without responsibilities."

The union's view, as expressed by Dennis Malayko, health and safety representative of the Alberta Union of Public Employees and chairman of the health and safety committee of the Alberta Federation of Labor (AFL), is that the regulations are all fine but they don't have "enough teeth."

The AFL is lobbying most heavily for improvements to what it refers to as the workers' "three Rs": the right to participation in the daily decision making of occupational health and safety; the right to refuse work they consider dangerous and the right to information.

A major objection to the present sections of the Act regarding those rights is based on two oft-repeated phrases: "imminent danger" to the worker, for which the employer must take corrective action "as far as it is reasonably practicable for him to do so."

Malayko's argument is that "imminent danger" leaves out too many potentially dangerous situations, especially that of low-level, long-term exposures, and that "reasonably practicable" leaves too many escape hatches for the employer. He also said there is no real protection from dismissal for the worker who appeals an inspector's decision.

Merv Ellis

With regard to refusal to work because of imminent danger, Dr. Buchwald says that "imminent danger refers to danger unusual to that work. The fact is that some asbestos around is not good reason to stop working although it is good reason to notify us and get something done about it."

Some, but not all, of Malyako's concerns are currently being addressed in Bill 51, which amends the Act, which has just been passed by the legislature. Among the 22 amendments is one that adds "if on reasonable and probable grounds, he believes that" there is imminent danger and another adding the same conditions of probability for a worker believing he has been dismissed for complying with the Act.

If an employer or worker has failed to comply with the Act or its regulations, it usually results in an order from an OHS officer to comply. If this order is not followed, court action could result. The Act carries with it a maximum fine of $15,000 or six months in jail for a first offence and a $30,000 fine or 12-month imprisonment for a second or subsequent offence. The inspectors are also given the authority to issue a stop-work order.

"However," says Dr. Buchwald, "a great majority of the orders given by our staff are complied with." One of the reasons for this is the willingness of the inspectors, who in most cases have only general training, to bring in expert consultants whenever necessary. Another reason, says Dr. Buchwald, is that "the Act aims at preventing things from taking place rather than punishing people after the fact. Fines are more a way of notifying the public that the Act is being enforced."

There also have been few cases of either workers or employers appealing OHS decisions.

"Appeals are possible," says Dr. Buchwald. "Yet in the six-year period since we have been adminstering the Act, we have only had three or four appeals. I would like to think it's because the orders of our officers are considered fair so there is no need to appeal. Actually, in many ways, I would welcome more appeals as that would stimulate dialogue on the hazard and problems of compliance.

"However, few appeals come from workers appeal as almost all orders are issued against employers, to improve safety conditions. And, unless there is an imminent danger, the employer is given a reasonable time frame to take corrective action."

It is also generally accepted by all parties concerned that it is difficult to implement health regulations. Not only is safety more obvious and immediate but about 95 per cent of compensation costs are spent on safety. And it should be noted, says Dr. Buchwald, that the government is a servant to the public when it comes to implementing regulations.

Malayko also feels the strength of the industrial influence has caused neglect of clerical and microtechnology health problems (such as VDT terminals) compared to blue collar safety problems.

Dr. Buchwald, on the other hand, feels that the unions are not doing all they could to aid enforcement of regulations.

"If the unions would utilize all of the authority and powers they have under their collective bargaining rules," he says, "they could help us considerably. Unions give us very little support if workers are not using protective equipment. And if employers take action against workers for noncompliance, the unions take action against employers through their agreement."

All parties also agreed on the necessity of training and education of workers and employers in identifying and handling potential hazards.

"Employers could save a lot of money in the area of enforcement if they spent more time on education," says Malayko.

The education issue is particularly prevalent when dealing with chemical hazards. The substances may be properly labelled at the time of manufacturing but problems often arise when the product is dispensed into smaller containers, which may not be completely labelled. The problem is further complicated because few of the products are manufactured in Alberta and there is no control over interprovincial transport or over imports from the U.S. However, says Dr. Buchwald, the provinces and federal government are trying to develop a system which would include federal and provincial uniform legislation requiring proper labelling.

The current Alberta chemical hazards regulations identify education as the employer's responsibility. "However," Dr. Buchwald points out, "what is required by legislation does not necessarily take place. If it did, our occupational hygiene people would have little work."

Although occupational cancers may be the most publicized of occupational health hazards, they are not the most widespread.

BILL McKEOWN

Dennis Malayko

According to Dr. Robert Orford, executive director of Occupational Health Services of OHS, the two biggest medical surveillance programs in Alberta are for lung disease and noise.

Silica and asbestos regulations require that workers have a lung X-ray, lung function test and medical examination every two years. Employers are responsible for arranging and paying for the tests. Since 1966, there have been 16,000 X-rays and lung function tests taken, with an increased concentration in the past five years.

Hearing tests (audiograms) are required for all noise-exposed workers every two years, after initial tests one year apart. A summary of the results for workers at each worksite must be provided to the government. About 40,000 Albertans are now being regularly tested under this program.

Noise regulations require that any worker being exposed to at least 85 decibels over a 12-hour period must be provided with and wear protective equipment. The controversy here is that the unions say industry is not making enough effort towards noise abatement measures and industry claims workers are simply hurting themselves by refusing to wear protective equipment. Government compromises and tries to encourage both sides to improve what they can.

The intent of the programs is multipurpose. They enable OHS to maintain records, help set and evaluate standards as well as to help diagnose problem conditions before they become too serious.

But perhaps the greatest need in terms of occupational health is more effective communication and co-operation among workers, employers and government. The Act, as recommended by the Gale Commission, provides the framework through the establishment of a 12-person Occupational Health and Safety Council, which advises the minister and handles appeals and is made up of representativs of labor, industry and the public; and the encouragement of the formation of health and safety committees within businesses.

Dr. Buchwald says the council has a very important role as an arbitrator. "But," he says, "its overall importance depends on the kind of role labor and industry would like to give it. Generally these organizations have found the direct lobby more useful than an indirect lobby through the council."

The health and safety committees have been effective where it has been possible, and the effort has been made, to set them up and use them.

As Dr. Buchwald says, "We will never see the same attention to health hazards as we do to traumatic hazards on the worksite".

But the situation in Alberta has improved greatly in the past six years and should continue to improve as awareness leads the way to more effective communication and co-operation.

Tom Shand, public relations manager of the Alberta Lung Association, is a former newspaper reporter

Sharon Adams

The Individual Response

What you can do.

First aid training, like this one held at Bow Valley Industries in Calgary, can be an important part of an industrial safety program

Most workers today can look forward to retirement when they will have time to pursue interests earlier crowded out by jobs, with enough income to live comfortably, and be healthy enough to remain active.

To ensure that fate, these workers in the millions are donning jogging suits and picking up racquets to become and stay fit for a longer, happier life. In addition, those workers are paying closer attention to health and safety hazards on the job.

Wendy Kinsey, safety training co-ordinator for occupational health and safety at the University of Alberta, says there's more interest in job safety today than ever — an interest she links to the self-improvement movement of the mid-'70s.

Occupational health and safety (OHS) professionals, employers, and government agencies are eager to encourage this trend to cut down on lost time and decreased efficiency on the job today, and to cut current and future medical costs.

In fact, she says, "We want individuals to accept responsibility for their own safety. While somebody else on the job may know where the emergency exits are, why should any worker take the chance of trusting his or her safety to someone else?"

But what can the individual worker do to ensure that he or she remains ticking long after they're presented with the traditional gold watch?

Experts agree on a three part program: information, prevention and action.

Being aware of hazards is the most important step — and that involves first developing a "safety first" attitude both at home and on the job. The Alberta Lung Association can help workers determine if their own, or colleagues', smoking presents additional health hazards — from smoke concentration in poorly-ventilated areas or increased liability to disease in connection with other substances breathed in on the job.

The Canadian Cancer Society can provide information on carcinogens in the environment, and on prevention and early detection of the disease. The family doctor can advise on avoidance of heart disease and the importance of fitness.

Workers conscious of health and safety will also arm themselves with information about on-the-job protection and about health and safety regulations enforced by the provincial department of Workers' Health, Safety and Compensation (OHS division).

Prevention includes keeping abreast of training and development offered by the employer, keeping an eye peeled for possible dangers, and keeping informed of safety and health research which could avert problems later.

The employee must be willing to call on his or her allies for support should a refusal to do a hazardous job be necessary, alert government inspectors, and, if possible, use union grievance procedures.

But the Alberta worker's biggest ally is the law.

Amendments to the Occupation Health and Safety Act, which have just been passed by the legislature will more clearly spell out the duties and responsibilities of employees, workers and the government. In addition to the Act, workers can familiarize themselves with its regulations, which govern particular hazards they may face.

If a worker identifies a hazard, and a reasonable appeal to the employers requesting it be reduced or eliminated is not successful, Rozel says one of the major ways employees can help themselves is to notify his department, anonymously if they wish.

Secondly, he says, employees can refuse, with protection from retribution, to undertake a job involving an unusual hazard to themselves or other employees.

One recent example of this is a Calgary worker who refused early this year to operate a piece of equipment with bad brakes. Fired, the employee appealed to OHS. The employee's complaint was found to be valid, and the company reinstated the worker.

After investigation, says Rozel, about 60 per cent of such employee calls prove to be

BILL McKEOWN

Wendy Kinsey

justified — but not all who could take advantage of this right do. "A major problem is that people just don't know we're here."

Al Kettles, co-ordinator of loss control for Bow Valley Industries in Calgary, says workers' health and safety — both on and off the job — should concern everyone in the company from the chief executive on down.

"From a human point of view, no human wants to see another human being hurt. And from the economic point of view, no company wants to be put out of business because they have one accident. Why blow $4- to $5-million (on accident repair, lost employee time and worker replacement costs) when with a little planning and foresight, it could be going to the shareholders?"

For that reason, safety must also be a 24-hour concern. Off-the-job injuries and sickness, he says, cost at least four times as much in terms of human suffering, lost time, worker replacement costs and reduced efficiency as job site accidents. "A man who leaves work, jumps on a motorcycle and breaks his back in an accident can triple the employer's cost. Not only will he be paid for time missed, but the company may also have to hire a temporary replacement and pay overtime to make up for it. A man who loses a wife or child may take months to recover — and all the while it affects his performance at work."

Since he started in January, Kettles has helped raise the safety consciousness of the company's 3,200 employees scattered around the world through home deliveries of Family Safety, a U.S. National Safety Council publication on prevention of home, traffic and recreational accidents, and the company has 60 volunteers taking defensive driving courses and 106 studying first aid.

The on-the-job safety program has five "modules": organization and administration, including a statement of objectives and responsibilities; hazard control, including safer design of facilities and purchase of safe equipment; education, training and motivation of employees; and accident investigation and off-the-job safety.

"But the biggest concern is prevention – 95 per cent of the effort is spent there."

Ernie Luders, supervisor of safety training for Alberta Power, stresses the importance of prevention as well. "Close to 90 per cent of all accidents are preventable. Most are due to circumventing procedure — shortcutting." This is "either a training or an enforcement problem."

Alberta Power's 300 employees in eight power plants across Northern Alberta therefore begin their jobs with "safety indoctrination" which "really opens their eyes. (Employees) have to be informed by the people they work for as to what the hazards are and how to avoid them."

Alberta Power and Bow Valley Industries Ltd. both sponsor joint work site safety committees which meet regularly to discuss hazards.

"People who work in an environment aren't stupid," says Luders. "They're able to spot hazards. But if there's no mechanism for reporting them, then you have troubles."

AN BRUN

Al Kettles

Kettles agrees on the importance of the monthly meetings involving all employees at a specific job site. They "alert first-line supervisors to safety hazards, and if one comes up at a meeting, it's documented and somebody's assigned the responsibility of fixing the problem." The meetings also allow supervisors to review safe operating procedures, introduce new safety-related subjects and they also "ensure safety and loss control get at least one hour of undivided attention from each employee every month."

Bob Spencer, director of education and program development for the department of workers' health, safety and compensation, says his branch gave first aid training in 1982 to about 13,000 workers, talked to about 5,000 more about specific hazards, and put on 20 safety seminars — mostly at the request of employers in the province.

Training of supervisory personnel to predict failure in any of three problem areas is a

ALBERTA GOVERNMENT PHOTO

key element. Environment, equipment and tools and "the human element" must be monitored. Air-borne contaminants, for instance, may be vastly reduced or eliminated by an environmental improvement — better plant design. Workers can "fail in physical ability, lack of training, mental attitude or use of unsafe job practices."

The worker's final ally could be a trade union.

Bill Spring, health and safety representative for the International Association of Heat and Frost Insulators and Asbestos Workers, says unions can be useful to agitate for establishment of joint safety committees (which are voluntary for most Alberta companies), to pursue complaints through negotiation and grievance procedures, and to provide information about current hazards and research potential dangers.

But the unions' sphere of influence can be limited by circumstance — the first being that the vast majority of Alberta workers are not represented by a union.

Secondly, the number of health and safety clauses in negotiated contracts — and thus grievance procedures — can be limited by economic circumstances. Safety precautions cost money to implement, and that could represent the difference between a union contractor and a non-union company winning a contract bid.

"Even with hazardous materials," Spring says, "there are methods of handling which reduce the risk. On some job sites employers and employees ignore safe handling practices. (But) I'd say that for every (job site) that does, there are probably 10 that don't."

Spring suggests that unions and unrepresented workers should press for establishment of more joint worksite safety committees to provide "sure communication channels."

For instance, in a power plant under construction, a number of different trades may be employed, each working on a different level of the 12-storey plant, separated not by solid flooring, but by metal grating. Insulators may be creating dust all the other workers have to breathe in, welders could be dripping hot flack on other workers and pipe installers may drop pieces of grating cut away for access.

"A joint committee of all these workers and management could help develop practices to restrict the hazard each worker presents the others."

Not that the workers always get the action they want by appealing through such committees, though. In one recent case, he says, 20 to 30 workers at a chemical plant were exposed to ammonia when a pop-release valve in the middle of the plant suddenly spewed the chemical three to four meters into the air. Several workers received first aid after being overcome by the ammonia.

At the subsequent joint committee meeting, construction workers suggested the valves to extended so the ammonia would be more widely dispersed should the valve, a fail-safe to prevent explosive pressure buildup in the pipes, go off. They also suggested alarms to be installed to prevent workers unaware of the release from walking in to the area.

BILL McKEOWN

BILL McKEOWN

Bill Spring

"The (construction) phase was just coming to an end, and management explained that after the (construction) workers left, only their trained operators, much fewer in number, would be exposed. It offered emergency respirators so workers could walk out of the area."

Management also maintained there were minimal health hazards associated with ammonia. Unsatisfied, the union called OHS for an inspection (results at deadline were not yet known), and researched ammonia hazard.

"In my opinion, workers and their representatives don't realize the consequences of working with some products. And with technology today, the number of chemicals and different procedures, it's impossible for government (safety regulations) to keep up." He says more OHS representatives hired by unions would result in more information reaching workers — and faster.

For workers not represented by unions who wish to research hazards themselves, the workers' health, safety and compensation department OHS division libraries in Calgary and Edmonton can help. The Edmonton library is connected by computer with the Canadian Centre for Occupational Health and Safety, which in turn gives workers access to research and studies into hazards in other countries as well as across Canada.

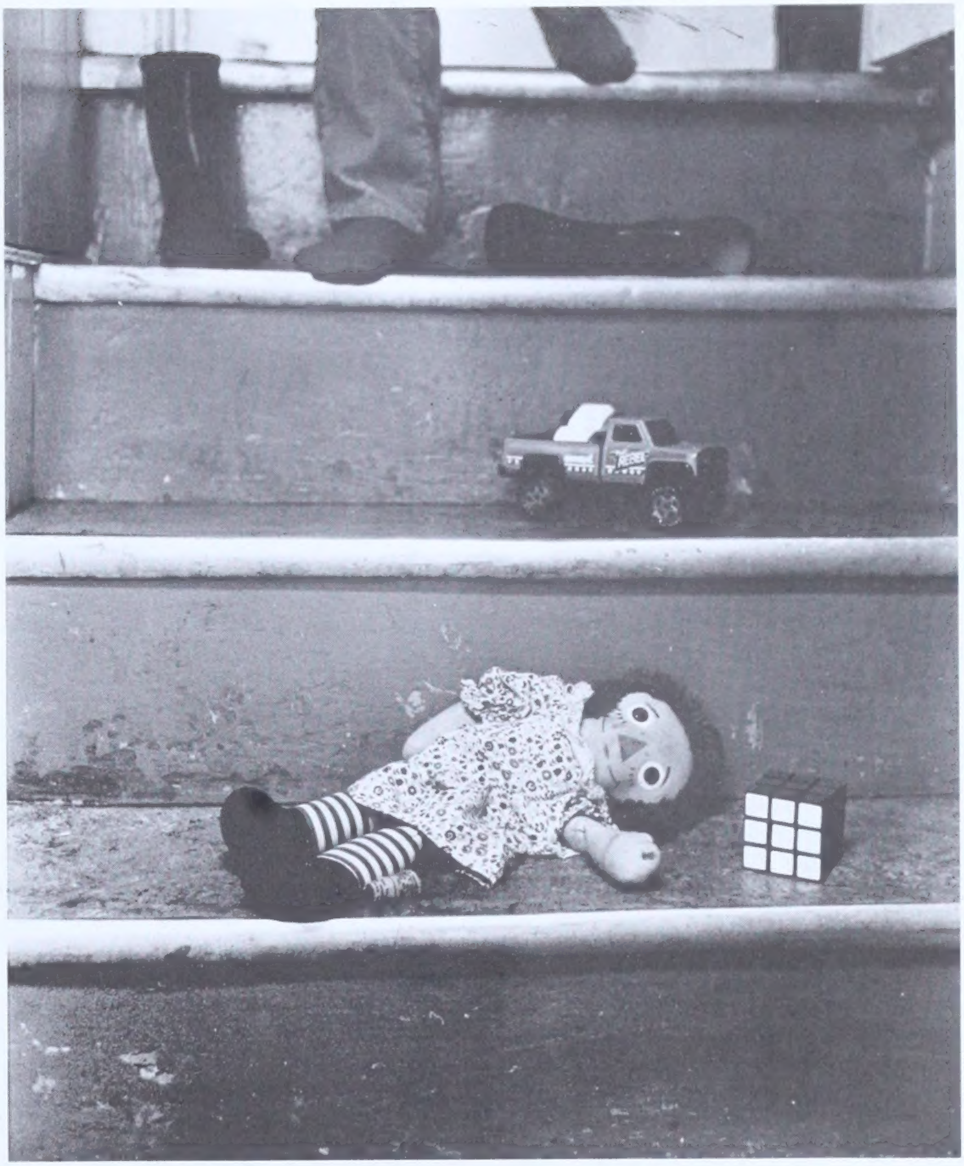
Even with the best union representation, the will to be informed and prepared, and access to the right kind of information, workers will occasionally be confronted with a situation they believe to be hazardous, but be unable to prove it. Under those circumstances, Spring says, workers can always take the ultimate action to protect themselves.

"If you have no choice — and you're very concerned — you can always quit. No job's worth a life."

Sharon Adams is a Calgary journalism instructor and freelance writer.

Using Environment Views in The Classroom

prepared by Doug Ramsay



BILL McKEOWN

"In Every Area, More Education Is Needed"

As Maryhelen Vicars states in her introduction "... our writers found one refrain from industry, government and workers' organizations: in every area, more education is needed." Some of the articles point out that more edcuation is becoming available both in the workplace and in the home (through the media and government agencies). However, it is necessary for schools to begin to make students aware of some of the problems with the home and work environment before they enter the adult world and are more exposed to these problems.

The questions of how, where and when these issues of the home and work environment should be addressed are difficult to answer. The high school social studies and science curriculums are not particularly concerned with these problems, despite their importance.

In general there are three science areas and one social studies topic where the issues could be studied *but* both social studies and science teachers could and should use aspects of the issue as a current events topics. This edition of *Environment Views* could be used as a basis for class discussions as well as a starting point for further research in one of the areas outlined below.

Relationship to Curriculum

Social Studies

The major issue concerns the right of the individual to safe and comfortable home and work environment. Some general issues which could be discussed in any Grade 9 to Grade 12 classroom:

- Should potentially hazardous materials be used in home construction? (consider urea formaldehyde insulaton as an example)
- Should new forms of technology be proven safe *before* they are used in the workplace? (consider video display terminals as an example)
- To what extent should unions and workers be concerned with safety problems (what standards of safety are acceptable)?
- Should toxic chemicals be banned from agriculture and industry?
- Who is responsible for carcinogens in the workplace (particularly asbestos and PVCs)?
- How important would work safety and health standards be to you in choosing a job?

Social Studies 10 — Topic A — Human Rights in Canada

- To what extent do workers have the right to a safe and healthy work environment?
- To what extent should individuals be protected to ensure a safe and healthy home environment?

Science

There are no clear areas where the home and work environment would fit into the high school problem in the science areas. However, the issue is important and it can (and should) be included in discussions of other environmental concerns.

Biology 20 — Unit II — Environmental Biology

Could include home and work environment in section 5.

Biology 10/20/30 — Student Projects

Among the areas which could be studied:

(1) the effects of the work place on the health of the individual
(2) a study of the major sources of environmental hazards to the individual in a particular home or work place.

Science 11 — Optional Unit

As a unit of study for students the issue presents some interesting and worthwhile areas for Science 11 students. The unit could be presented in such a way as to make students aware of the difficulties they will soon face in the work world and when they set up their own homes. For example:

(1) A report on the students' present home and school (and work as well) environments.
(2) A report on the existing government standards for health and safety in home and work.

If undelivered, return to:

Environment Views
Alberta Environment
9820 - 106 Street
Edmonton, Alberta T5K 2J6

Environment Update

Environmental Law

The Environmental Law Centre and the John Janzen Nature Centre will again join forces to present a five-session evening course on environmental law to be held at the nature centre on alternate weeks beginning November 8. The course will provide an opportunity for the public to become acquainted with environmental law, legal actions and remedies, within the context of topical Alberta issues.

The Environmental Law Association has begun publishing a quarterly newsletter on environmental law issues in Alberta. Subscriptions will be $10/year. Further information on either the newsletter or the course is available from the centre at 411-10201 104 St., Edmonton T5J 1B2, or by calling 425-6740.

Agricultural Land Hearings Set

The Environment Council of Alberta has for some months been preparing background research and publications for a series of public hearings on "maintaining and expanding the agricultural land base in Alberta". The hearing panel was appointed in March and the hearings are scheduled to begin October 12, with 16 locations throughout the province on the panel's itinerary. A special public hearing will be held in advance of these dates, on July 28 in Fort Vermillion, to allow the panel to tour this area at the peak of the northern agricultural season, and to hear informal submissions.

In other areas, the panel is encouraging individuals and groups interested in making a presentation to submit a written copy by September 1, although advance submission is not mandatory. As background information the ECA has prepared a series of reports and summaries discussing in detail many of the issues expected to be raised during the hearings. The ECA also has a 28-minute film, "Tomorrow's Bread" available for loan. Both the publications and the film are available free from the ECA. Phone 427-5792 Edmonton; Zenith 06075 outside Edmonton.

Water Conference

The proceedings of the 1982 Resource Management Conference at Banff have been published in a new brochure, *Water Policy for Western Canada: The Issues of the Eighties*. Now available from the University of Calgary Press, the brochure was produced by the conference sponsors, the Banff Centre School of Management.

For more information, call Susie Washington, program manager, 762-6137.

Alberta Standards Compared

The Environment Council of Alberta's Public Advisory Committee has just released a report prepared by Professor Al Lucas of the University of Calgary and M.A.H. and A.T. Franson, environmental consultants in Vancouver, entitled *Environmental Standards: A comparative study of Canadian standards, standard-setting processes and enforcement*.

This is a sourcebook for professionals, but also of interest to the general public, which compares Alberta's standards to those of the rest of the country, and makes recommendations in all three areas.

For more information, contact the Environmental Council of Alberta, 8th Floor, Weber Centre, 5555 Calgary Trial, Edmonton Alberta T6H 5P9. Phone 427-5792 Edmonton; Zenith 06075 outside Edmonton.

Aquatic Toxicity Workshop

The 10th Annual Aquatic Toxicity Workshop will be held in Halifax November 7-10, 1983. It is one of a continuing series of annual workshops on aquatic and environmental toxicology in Canada, covering topics from basic research to applications in environmental monitoring, setting of regulations and guidelines and forming water quality criteria. The emphasis is on an informal exchange of ideas and information on the topic among all interested persons from industry, government, universities and consulting firms.

For further information, contact
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Banff School of Management Resource Management Programs

Sept. 18-23 Project Assessment Using a case study approach focussing on gas processing plants, this course will focus on the process of impact assessment, from site selection through the assessment review process.

Oct. 30 - Nov. 3 Presenting Environmental Evidence A workshop for professionals, to teach and demonstrate ways of preparation and presentation of evidence before regulatory tribunals, commissions of inquiry and courts.

For more information, call Susie Washington, program manager, 762-6137.

If you have a short news item of province-wide interest you'd like to contribute to Environment Update, please send it to the editor at the address on the Contents page. The editor reserves the right to select and edit the items.